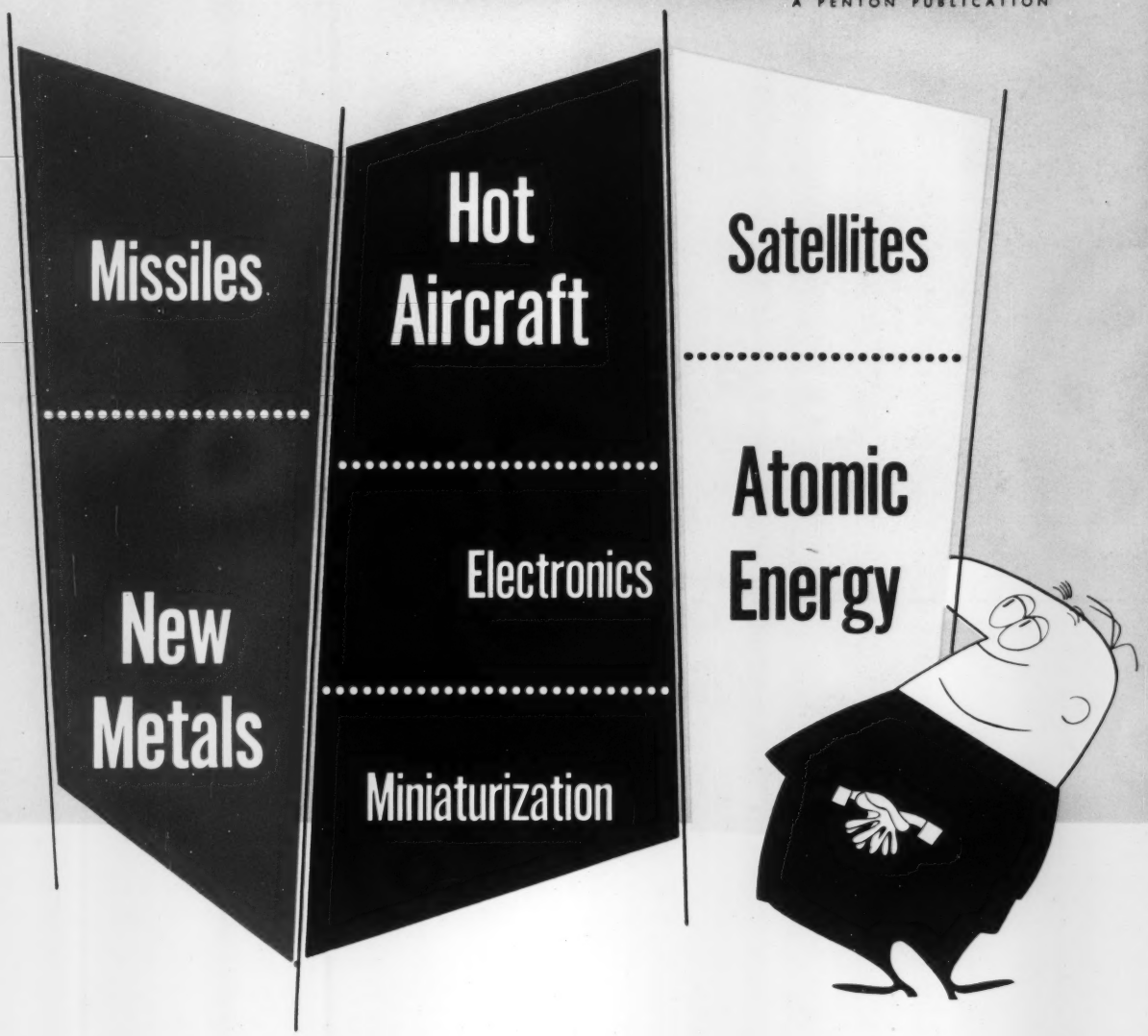
A PROGRAM FOR MANAGEMENT
1957 . . . . No. 7

AUGUST 12, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



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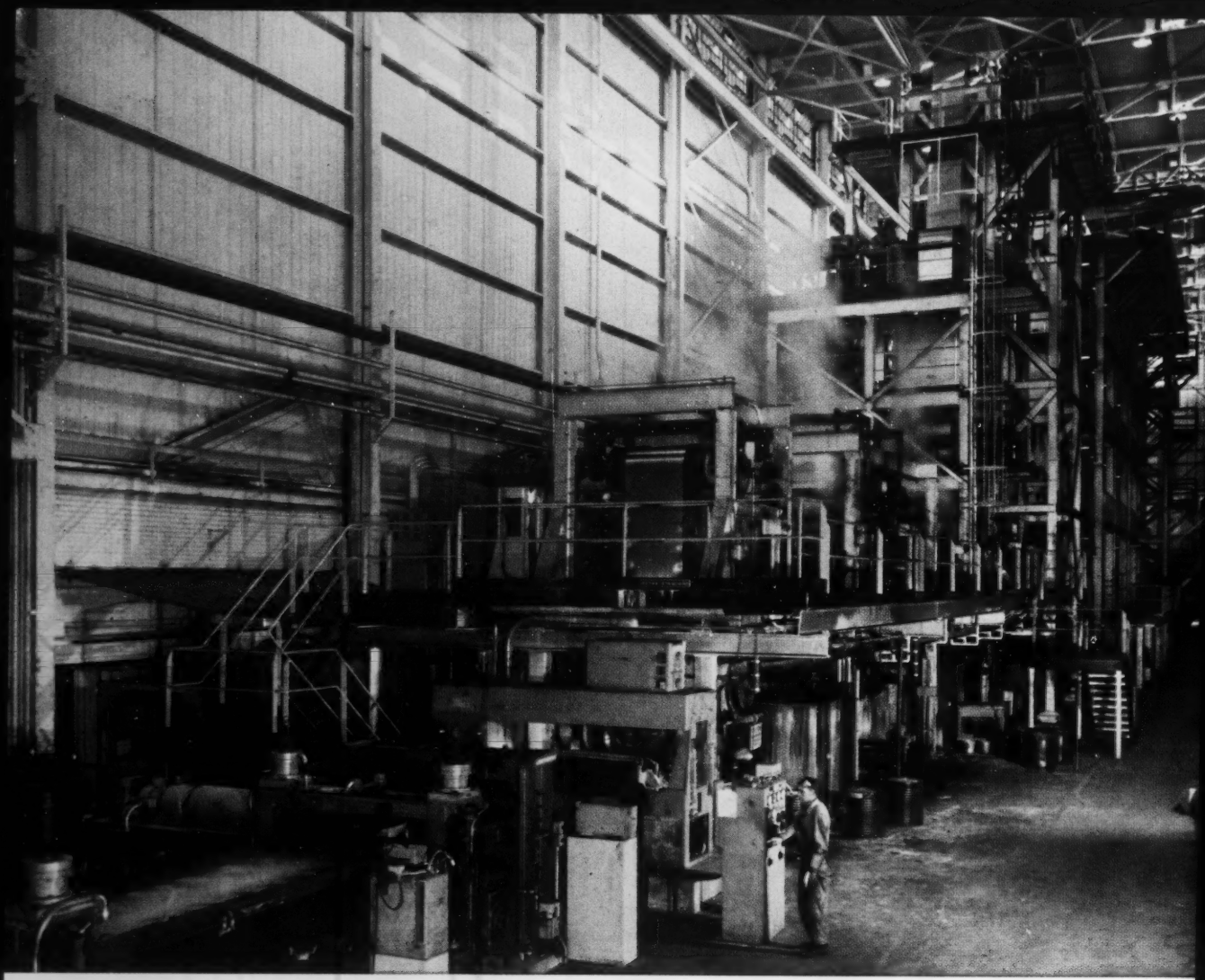


Continuous ANNEALING LINES...

• This is one of several Continuous Annealing Lines designed and built by Aetna-Standard. The line processes 48″ wide strip maximum at 1000 feet a minute at Dominion Foundries and Steel, Limited, Hamilton, Ontario, Canada. This line has been designed so that the Annealing Furnace can be bypassed and strip run through for cleaning only.

Like Continuous Galvanizing or Tinning, a Continuous Annealing Line requires efficient design and rugged equipment. As a pioneer in Continuous Lines and other equipment for processing sheet and strip, Aetna has broad experience in the design of equipment required for your specific application.

Our Sales Engineering Staff is available for consultation to help analyze your requirements upon your request.

AETNA • STANDARD

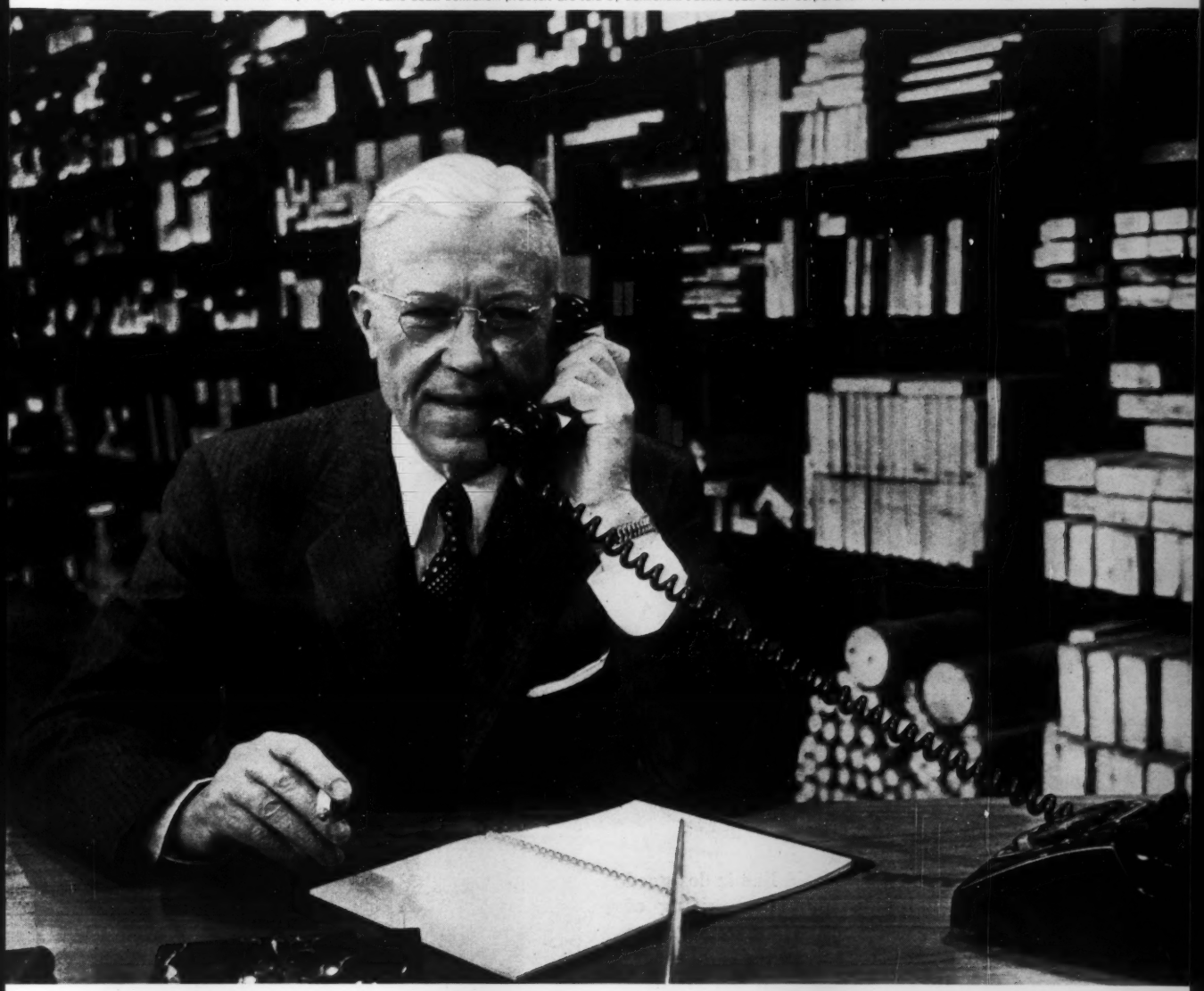
THE AETNA-STANDARD ENGINEERING COMPANY

GENERAL OFFICES: PITTSBURGH, PA. **PLANTS: ELLWOOD CITY, PA., WARREN, OHIO**

CONTINUOUS GALVANIZING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC

Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corp.



For Answers to Tool Steel Problems

CHECK WITH YOUR BETHLEHEM DISTRIBUTOR

Virtually every business day you are faced with a question or two about tool steel. On occasion the solution is relatively easy, such as ironing out some detail about delivery. But often it can be considerably more complex—perhaps weighing the merits of two similar grades, or determining the proper cycle of heat-treatment to obtain a more effective die life.

Whatever the problem, it calls for expert opinion, and that's where your Bethlehem tool steel distributor comes in. For he's a specialist in tool steel matters, and it's part of his job to see that your questions are answered promptly and courteously. Besides, he can also save you time when you need tool steel, for his diversified stocks are ready to go at a moment's notice. Make it a point to check with your Bethlehem distributor often. It will take but a few minutes at most, and it's one of the wisest moves you can make.

BETHLEHEM STEEL

NEW CAM OPERATED BORE-MATIC

provides

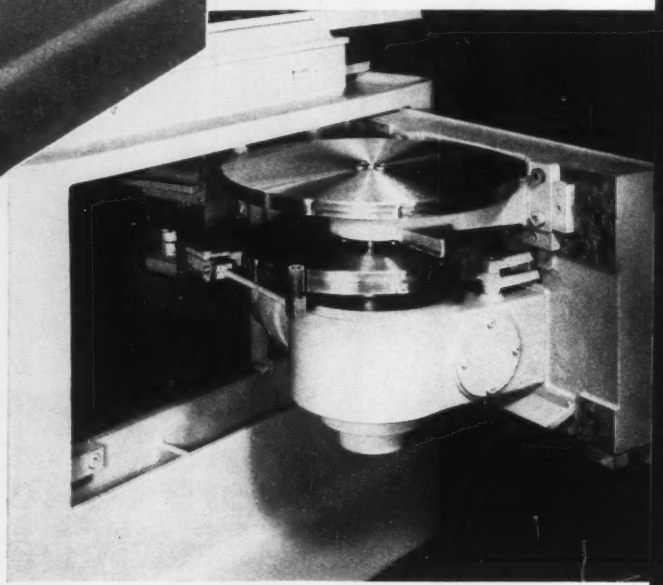
wide capacity range

for small to medium work

Heald Model 2215
Cam Operated Bore-Matic

Table Stroke	9"
Boring Stroke	5"
Table Pad	18" x 41"
Cross-Slide Stroke	4"
Cross-Slide Table Pad	13½" x 22½"

Entire cam unit and drive swings out on hinged panel for easy access. Locating pads on panel and base assure positive location of cams at all times. Wipers clean cam surfaces just prior to contact point of cam and follower at which point continuous lubrication is applied.



THIS new addition to the Heald line is designed for continuous, high-production Borizing of work where cam type operation and control are desirable. Table and cross-slide feeds are controlled by separate cams located in the machine base, each cam being so contoured as to provide the desired cycle. The cross-slide cam can also be arranged to operate cross-feed units or feed-out quills. By appropriate design of table and cross-feed cams, any combination of straight, taper or contour boring, turning, facing or grooving operations can be performed. For complete information, send for a copy of Bulletin 2-2215.

IT PAYS TO COME TO HEALD!

THE HEALD MACHINE COMPANY

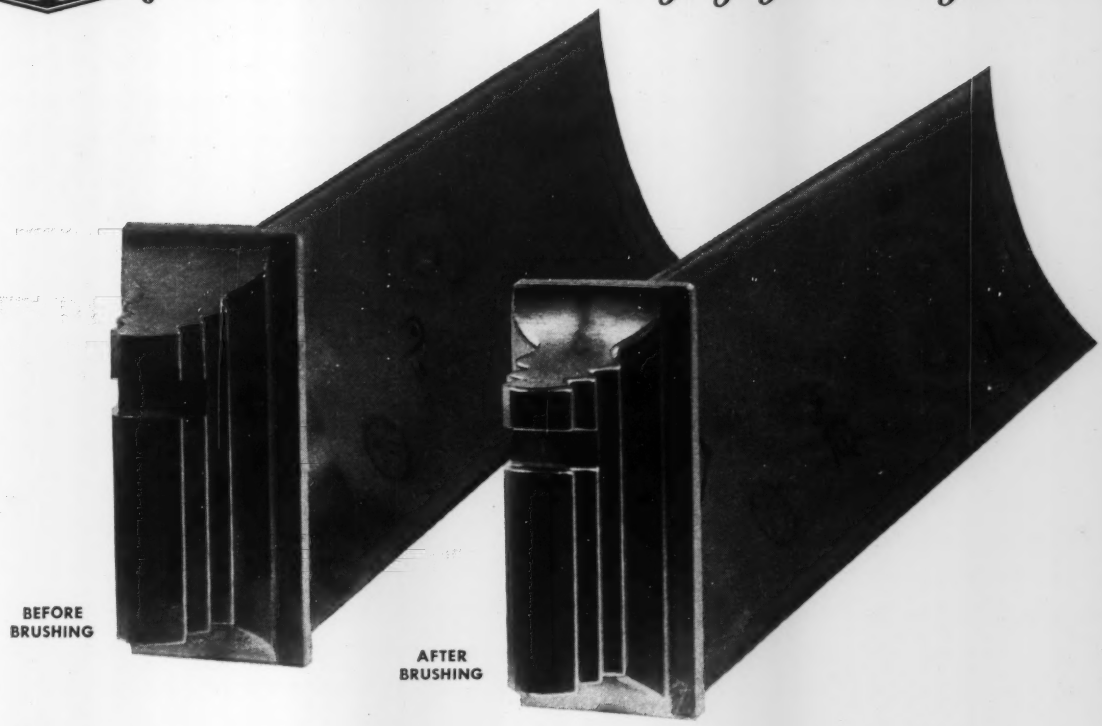
Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

HEALD®

OSBORN BRUSHING METHODS *worthy of your confidence*



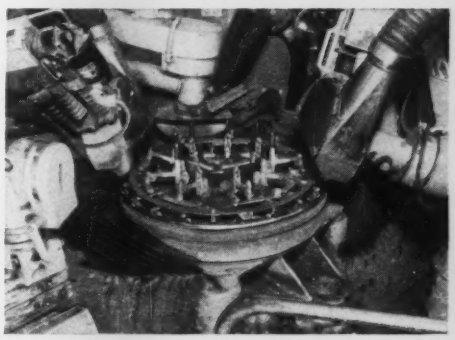
Root of a Production Problem

. . . solved with Osborn Power Brushing

YOU'RE looking at the root end of a turbine blade for jets . . . one of hundreds that go into every engine. Size and surface finish of the root must be held to exacting precision for perfect assembly and highest ultimate strength. Yet production costs must be down to earth.

Utilizing Osborn's power brushing method, jet blades are held in a fixture and traversed past Osborn Fascut® Brushes. In one simple operation, all minute burrs on the root end are removed, surface junctures are blended eliminating sharp corners where stress concentrations might occur. Results are uniform, dependable . . . at a high rate of production. The operator has only to load and remove parts.

An **O**sborn **B**rushing **A**nalysis will show you how Osborn Power Brushing can simplify your metal-finishing operations. Write *The Osborn Manufacturing Company, Dept. G-58, Cleveland 14, Ohio.*



Osborn Brushamatic® 51-3L with three brushing heads finishing root ends of jet blades.

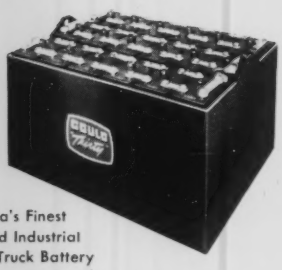
Send TODAY for the new 20-page Brushamatic Booklet

Osborn Brushes

BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES • BRUSHING MACHINES • FOUNDRY PRODUCTION MACHINERY

for a surge of power
. . . or steady flow

You can depend on **gould** *batteries*



America's Finest
Gould Industrial
Truck Battery

Maximum power and long, trouble-free battery life, under *all* operating conditions, are yours with every Gould Battery you buy. And, to insure that you fully realize these benefits, Gould employs a staff of full-time application engineers. These men help you set-up your battery maintenance shop, help you establish sound preventive maintenance procedures, make routine calls to check on conditions, and instruct your new personnel in correct procedures. Do you see how you can increase battery life with this service? Why not talk it over with your local Gould representative. He's listed in the yellow pages under "Batteries." Gould-National Batteries, Inc., Trenton 7, N. J.

More Power to you from Gould

Always Use Gould-National Automobile and Truck Batteries

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The Metalworking Weekly

August 12, 1957
Vol. 141 No. 7

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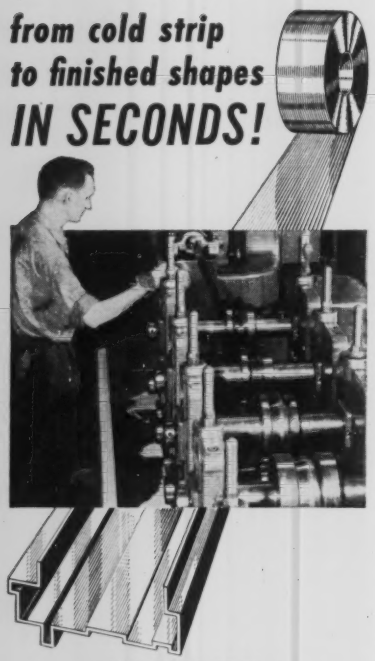
from cold strip to finished shapes
IN SECONDS!



YODER ROLL-FORMING MACHINES

If you are in the business of manufacturing a product that is, or could be, made wholly or partly from flat rolled metals in thicknesses up to ½", a Yoder Roll-Forming machine can help reduce your production costs.

Cold-formed shapes of every description —including structurals, tubular products, moldings, trim, roofing and siding, panels, cabinet shells, etc., can be produced on Yoder cold-roll forming equipment at the rate of 25,000 to 50,000 feet per day at a conversion cost of only a fraction of a penny per foot! With speeds and costs such as this, even part-time operation of a Yoder roll-forming line is a profitable investment!

Additional operations such as welding, coiling, ring forming, perforating, notching, embossing or cutting to length can be simultaneously introduced to the basic shape at little or no additional labor cost. Yoder engineers are at your service in explaining the advantages of roll-forming for your individual needs.

A new, revised, Fifth Edition of the Yoder Cold-Roll Forming book is just off the press. In addition to economic and mechanical possibilities of cold-roll forming, it contains numerous illustrations of end uses and applications of roll-formed shapes. Write for your copy today.

THE YODER COMPANY
5502 Walworth Ave. • Cleveland 2, Ohio

ENGINEERING YODER MANUFACTURING
COLD ROLL FORMING MACHINES

behind the scenes

Brave New World

"Here today and gone tomorrow" is an old Maori expression suggesting that temporal enterprises are fleeting, and we are stricken by wonder, not so much at the thought that those old antipodal aborigines could have cooked up a saying (instead of a missionary), but a saying that so aptly describes modern metalworking on the brink of new technology. For example, if you are in the metalworking business today and neglect to make new products, or to modify your products, or to channel your established products into new areas, or, failing all that, to acquire a new enterprise, your company stands an excellent chance of being referred to in the past tense.

A manufacturer of rivets for dog collars speaks. He has been in business since 1822, and before that his ancestors made quality dog collar rivets by appointment to His Majesty, the King. "How come I'll go out of business?" he demands truculently. "There'll always be dogs, won't there? Does STEEL hate dogs?"

"Perhaps you won't, and it is extremely likely, and up to now STEEL has never been obliged to take a stand on dogs," we replied. "However, we invite you to read STEEL's new Program for Management story, beginning on page 113. It is called 'Producing for the New Technology,' and it reveals the many opportunities that are waiting in such fields as missiles, aircraft, satellites, electronics, and miniaturization."

This exciting article mentions uses of new metals, too: zirconium, hafnium, beryllium, uranium, thorium, vacuum-melted alloys. Oh, and before we forget, let us remind you that the Maoris don't piddle around like STEEL in the matter of dogs; they are f o n d of them, particularly roasted.

Terrific Tome

Do you remember how you felt when you were 13 years old and had just acquired a fully illustrated copy of Robert Louis Stevenson's *Treasure Island?* And how, when you were only halfway through, you began to fret at the thought that soon you would be finished? Now that you are no longer 13, and your interests have switched from pirates to the fabulous world of metalworking, we have a feeling that you may recapture some of that thrill if you ever happen to latch on to a beautifully bound and stamped volume called *Metalworking Markets in the U. S. A.: A Sales Planning Guide.*

This book weighs 3 lb, and measures 13¼ x 10¼-in. It contains 246 pages. Prepared by the STEEL Market Research Department, it is a compendium of metalworking statistics gathered from the Bureau of the Census, Dun & Bradstreet, IBM Corp., Harvey Research Organization, Western Union, local Chambers of Commerce and the metalworking industry itself. State maps show the metalworking operations in each, which reminds us that when the book was being prepared, Art Director Bill Kellogg consumed a dozen packages of Tums because the maps didn't fit. "What are you going to do with a thin horizontal map like Tennessee on a vertical rectangle page?" he groaned, reaching for the ulcer pacifiers. "Or North Carolina? Or New Jersey, that bends the wrong way, or Oklahoma with a tail?"

We assumed the average reader would be less concerned than an art director with esthetic cartography, but this made no difference to Kellogg. Instead of abandoning himself to a thrilling contemplation of expenditures for new machinery and equipment, or plunging into a summary of metalworking's growth, he wanted to warn the citizens of Maryland that the western portion of their state was about to fall off.

Single copies retail for $25, but we understand this formidable price is designed to screen out persons who don't need the book. Those who think they are qualified to receive it may apply to a STEEL representative, or may write directly to STEEL, Penton Bldg., Cleveland 13, O.

Shrdlu

(Metalworking Outlook—Page 67)

B.F.Goodrich report:

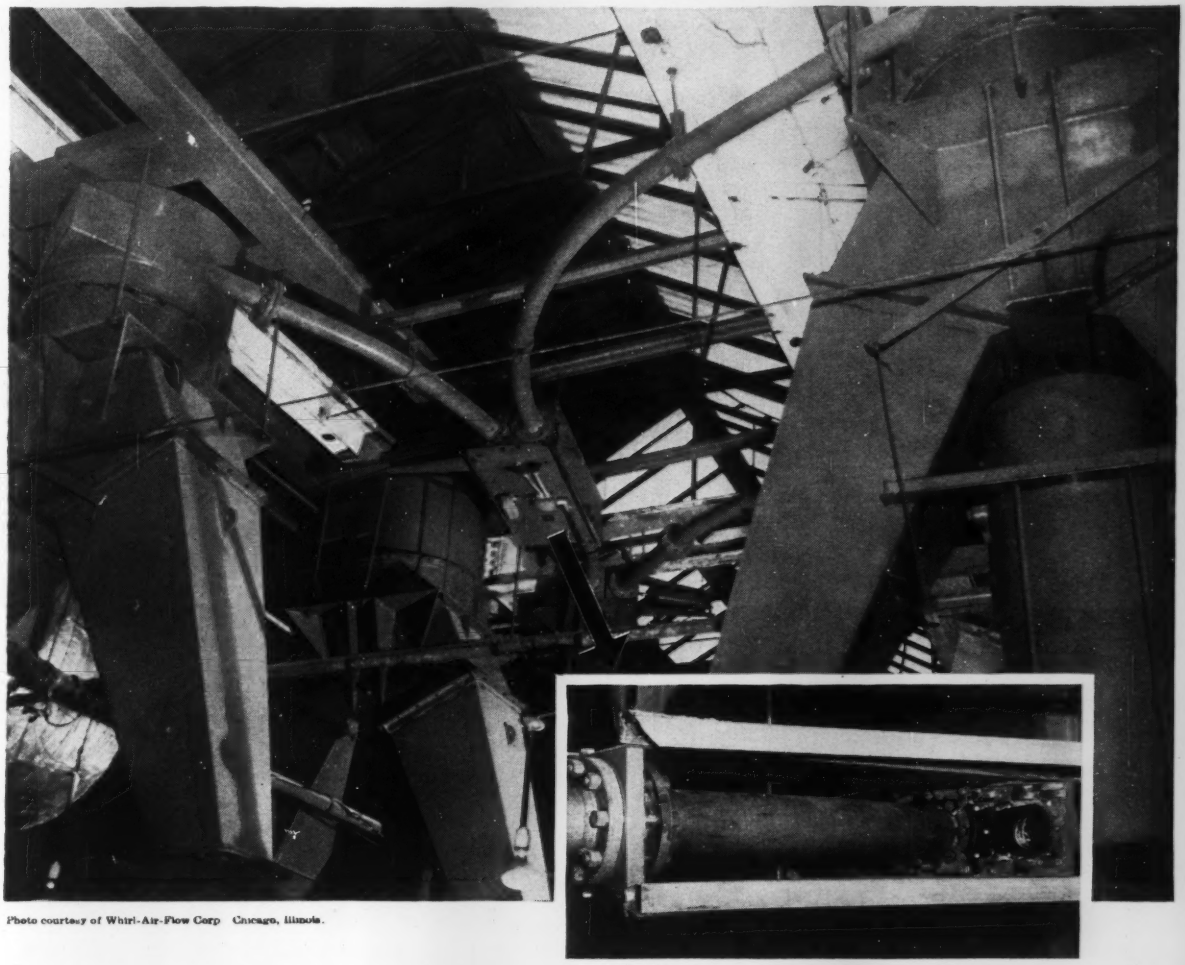


Photo courtesy of Whirl-Air-Flow Corp Chicago, Illinois.

Pipe carries sand the easy way

B. F. Goodrich improvements in rubber brought extra savings

Problem: In this foundry, workmen used to push wheelbarrows loaded with sand to the coremakers. Now the sand is simply blown through those overhead pipes to hoppers all over the building. Only one trouble.

A flexible hose was needed to switch the sand from one pipeline to another. (See inset.) Rubber hose was tried. The swirling sand quickly wore holes in it. Another kind stretched so much from the constant flexing that it jammed the switch.

What was done: When a B.F.Goodrich man heard of the problem he recommended a hose, specially developed by B.F.Goodrich to handle rough materials. It is made with a special wear-resisting rubber, so tough it outlasts hard steel 10 to 1 on many jobs. The hose has a specially treated fabric reinforcement that keeps it from stretching.

Savings: The B.F.Goodrich hose was tried. Instead of digging in and cutting, the sharp particles of sand simply bounce off the extra-soft rubber lining. It has now given 2 years of service and shows no signs of wear or stretch. In fact, the company making this equipment is now using only B.F.Goodrich hose.

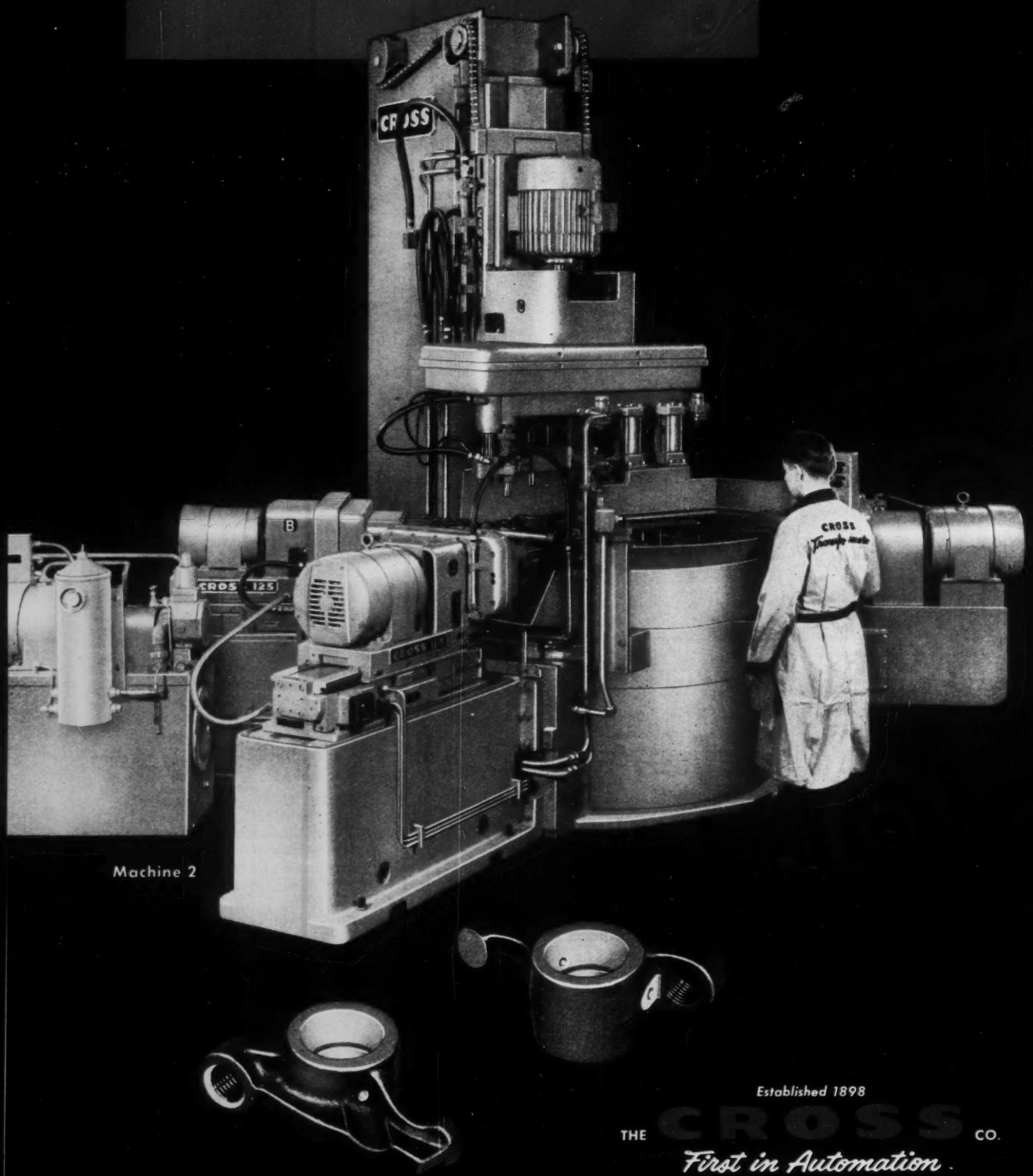
For information: This hose is one of hundreds of kinds B.F.Goodrich makes for thousands of industrial uses.

Your B.F.Goodrich distributor can recommend a hose exactly fitted to meet the special requirements of your work. And, as a factory-trained specialist, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-101, Akron 18, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

Two Dial Type Machines Process Valve Rocker Arms



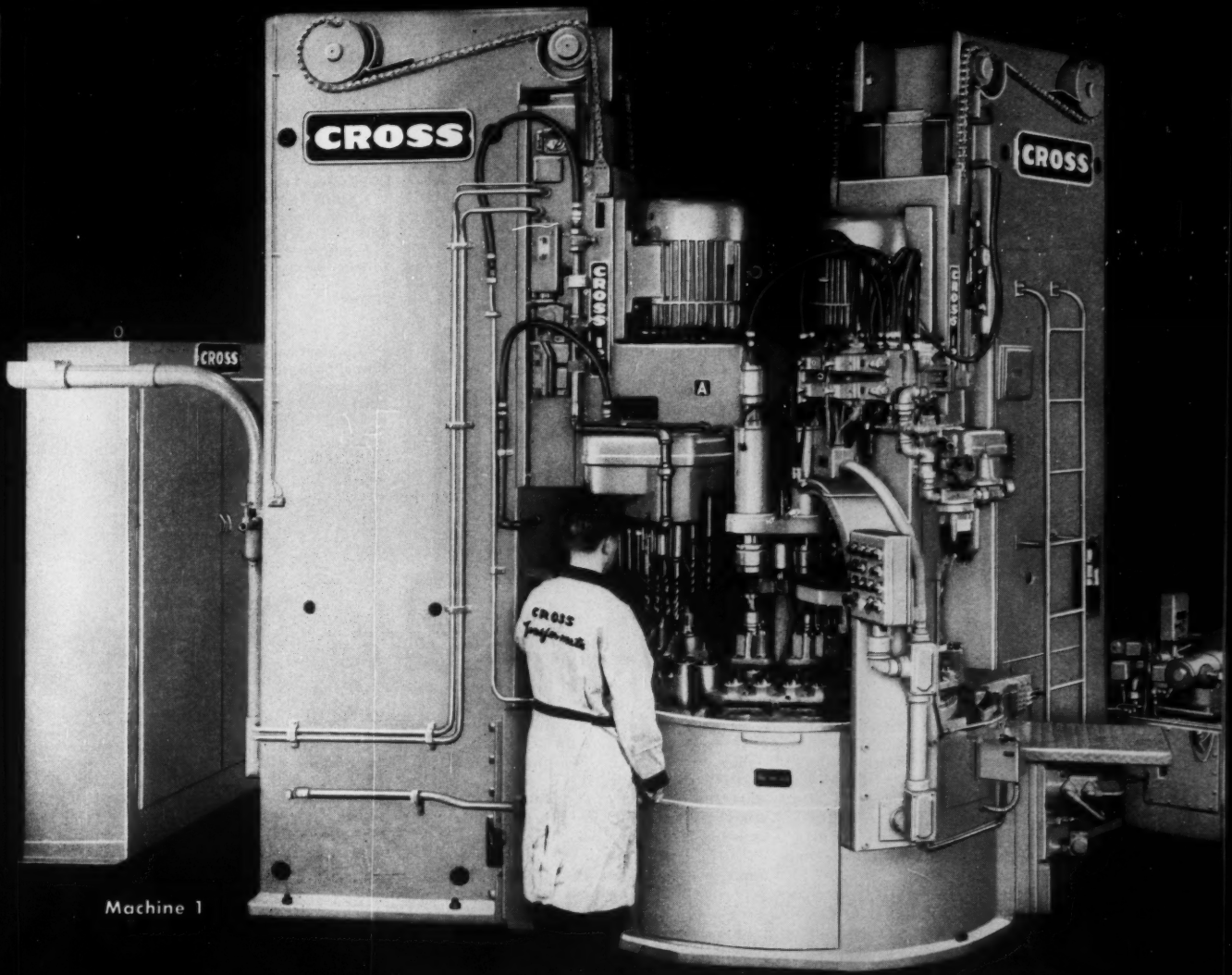
Machine 2

Established 1898

THE CROSS CO.

First in Automation.

PARK GROVE STATION • DETROIT 5, MICHIGAN



Machine 1

★ 800 pieces per hour at 100% efficiency.

★ Four parts machined in each station.

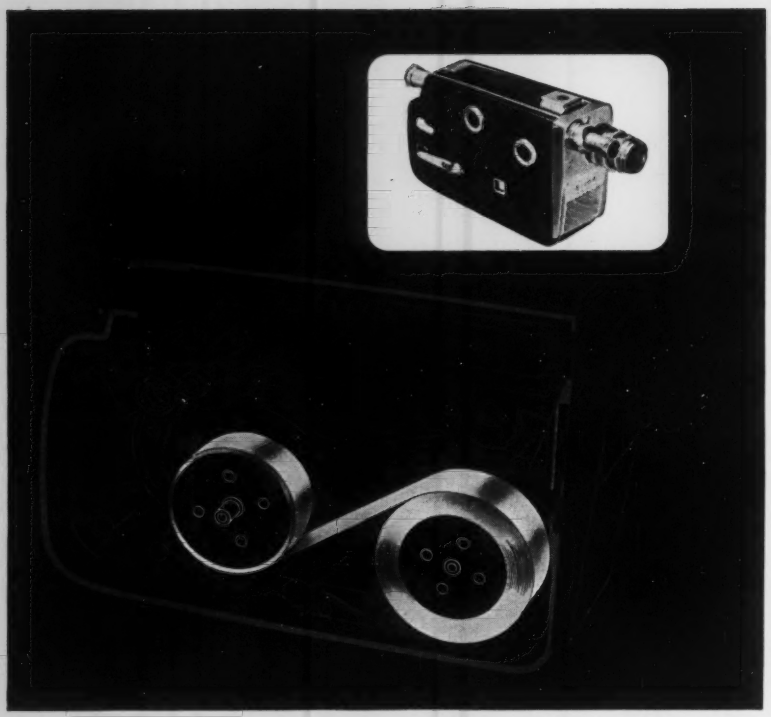
★ Machine 1 drills and reams rocker shaft hole; forms oil groove; drills one oil hole. Machine 2 drills, chamfers and taps adjusting screw hole; drills, counterdrills and spotfaces second oil hole.

★ Push button controlled power wrenches operate fixture clamps.

★ Cross "building block" construction provides flexibility for part design changes.

★ Complete interchangeability of all standard and special parts for easy maintenance.

★ Other features: Construction to JIC standards; hardened and ground ways; hydraulic feed and rapid traverse for drilling and reaming; individual lead screw feed for tapping; automatic lubrication; pre-set tooling throughout.



Make a Powerful, Long-Running Motor

USING A NEG'ATOR® SPRING

Using the NEG'ATOR constant-tension spring, a powerful long-running motor can be made by winding the NEG'ATOR band on a storage drum then *reverse-bending* the free end around a larger, output drum. The tendency of the material to recurl to its *preset curvature* around the smaller drum imparts a more constant output torque to the shaft of the output drum.

As the illustration shows, Eastman Kodak engineers have designed a NEG'ATOR Spring motor and have applied this motor to their new 16 mm Cine-Kodak K-100 Movie Camera. In this application, the NEG'ATOR motor drives the film and provides much longer film footage per wind than is possible with a conventional power spring—40 feet of film per wind, 100 seconds of exposure at the normal 16 frames per second speed.

By using a NEG'ATOR Spring as shown, Eastman Kodak's engineers obtained advantages in addition to longer film footage. The motor eliminates extreme torque variation and wasteful high torque output at full wind. It cannot "jump" or "skip" (solving a major camera-drive problem). It simplifies design of gearing and governor, requires no lubrication, permits full utilization of the work potential of the spring, and reduces over-all cost.

Used as a motor, as shown, or as a constant-tension extension member, a band, clamp, or clip, the NEG'ATOR might be just what you're looking for. You can learn more about the NEG'ATOR by reading Bulletin 310N which is available on request. Or write on your company letterhead for a sample NEG'ATOR Spring.

HUNTER SPRING COMPANY

19 Spring Avenue, Lansdale, Pennsylvania

SPRINGS • STAMPINGS • TEST APPARATUS

LETTERS
TO THE EDITORS

Apropos of the Times

I have just read your editorial, "Parable of the Prices," in the July 15 issue (page 51).

I want to compliment you. It is good reading, amusing, apropos of the times and certainly tells the truth.

I would like 150 copies to send out to our salesmen and sales agents.

J. E. Doan
Chairman
American Tool Works Co.
Cincinnati

The material is timely and should be brought to the attention of many people. In my selling organization, I have need for 200 copies to circulate to interested parties.

E. B. Carter
Vice President
Wheeling Corrugating Co.
Wheeling, W. Va.

Our senior vice president for sales was highly impressed by the message conveyed in your editorial. Would it be possible for you to supply us with 300 copies for our salesmen and sales representatives?

J. W. Hall
Director, Advertising & Sales Promotion
Heating & Air Conditioning Division
National-U.S. Radiator Corp.
Johnstown, Pa.

. . . it is one of the best answers to the rising price problem that so many of us have been faced with in these past few years. We would appreciate a dozen copies for distribution to our sales force.

L. Cantor
Sales Manager
Insinger Machine Co.
Philadelphia

Reads from Cover to Cover

On page 104 of the June 17 issue, there was an interesting article, "Turk's-Heads Shape Production Parts." Please forward a copy.

STEEL is one of the magazines which I read every issue from cover to cover. Congratulations!

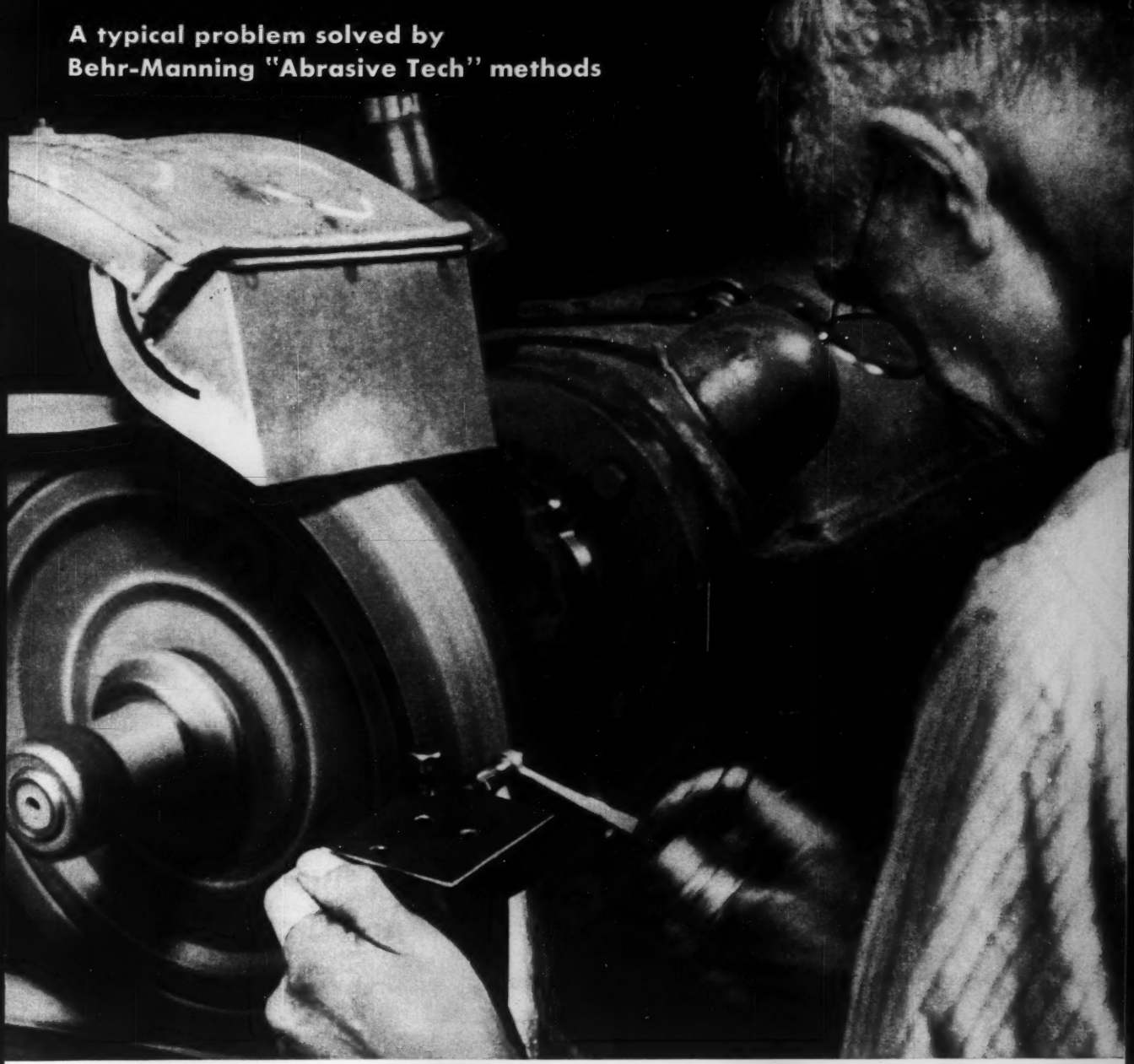
David M. Nason
Director of Industrial Products
A-S-R Products Corp.
Staunton, Va.

Research: Timely Subject

We were interested in the Program for Management article, "Research . . . Threshold to the Future," (July 15, page 93). It is a timely subject, and one that you have thoroughly developed in this article. We should like to

(Please turn to page 12)

A typical problem solved by
Behr-Manning "Abrasive Tech" methods



Here's how production jumped 23%: The outside diameter of the box end of this wrench is being polished with a simple fixture and one pass on a Metalite coated abrasive belt. The result of this "Abrasive Tech" method is fast, consistent polishing, since rotation and pressure of the wrench against the belt are always uniform.

Very often a Behr-Manning methods engineer can provide a helping hand with different finishing problems. Just call the nearest Behr-Manning office for a date. There are 17 well-equipped "Abrasive Tech" Methods Rooms, available for problem-solving, or helping finishers brush up on new techniques: Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Grand Rapids, High Point, Indianapolis, Los Angeles, Teterboro, Camden, San Francisco, Seattle, St. Louis, and Brantford, Canada. Main office and plant, Troy, N. Y. For Export: Norton Behr-Manning Overseas, Inc., Troy, N. Y., U.S.A.

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A DIVISION OF NORTON COMPANY

BEHR-MANNING PRODUCTS: Coated Abrasives • Sharpening Stones • Behr-cat Tapes
NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories

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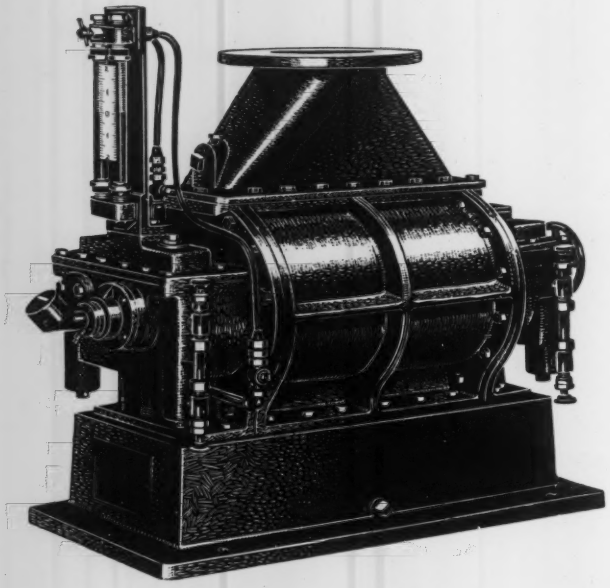


R-C rotary positive displacement meters retain "cash register" accuracy

For utility metering or proportioning of process gas, Roots-Connersville rotary gas meters assure permanent accuracy unmatched by any other design.

- 15:1 accurate operating range.
- Accuracy is not affected by variations in specific gravity, rate of flow, pulsations or impurities.
- Precision machined measuring chambers insure maintenance-free accuracy.
- No valves, diaphragms or other small parts are used, eliminating leakage due to wear.

R-C meters will meet your most exacting requirements in capacities from 2,000 to 1,000,000 cfh. Write for Bulletin M-152 for complete specification details.

Engineers—unusual career opportunities await you at Roots-Connersville. Address your resume to Professional Employment Manager.

ROOTS-CONNERSVILLE BLOWER

A DIVISION OF DRESSER INDUSTRIES, INC.

857 Hillside Avenue Connersville, Indiana. In Canada—629 Adelaide St., W., Toronto, Ont.

LETTERS

(Concluded from page 10)

have more in our organization familiar with this and, accordingly, would appreciate eight copies.

P. R. Johnson
Assistant to the President
Wyman-Gordon Co.
Worcester, Mass.

Thought-Provoking Plan

Your publication is to be complimented upon the helpful article, "How To Aid Your Engineers" (July 15, page 64). It appeared to be a thought-provoking analysis of a pressing problem facing our profession and the nation. I would appreciate a copy.

D. L. Powell
Research Engineer
Engines, Fuels & Lubricants Section
Armour Research Foundation
Illinois Institute of Technology
Chicago

Cure for Weld Trouble

We are fabricating stainless and have run into some of the troubles mentioned in your two-part article, "How To Avoid Trouble with Stainless Welds" (June 24, page 116, and July 1, page 70). I would appreciate two copies.

W. C. Richardson
Design Engineer
Aircraft Division
Parsons Corp.
Traverse City, Mich.

Market Analyst Wants Copy

I have just finished reading the fifth article in your 1957 Program for Management, "Managing Our Markets" (June 17, page 93). It is one of the finest of its type I have read. I would appreciate a reprint.

G. W. Happe
Market Analyst
Kearney & Trecker Corp.
Milwaukee

STEEL Helpful to Office

The weekly copy of STEEL is received by this office with great pleasure. Many of the articles are most helpful in our daily tasks. The article, "Vacuum Melted Alloys Grow" (July 22, page 137), is most interesting. We would appreciate three copies.

C. Cerasia
Buyer, Production Purchasing
Wright Aeronautical Division
Curtiss-Wright Corp.
Wood-Ridge, N. J.

Boosting Factory Productivity

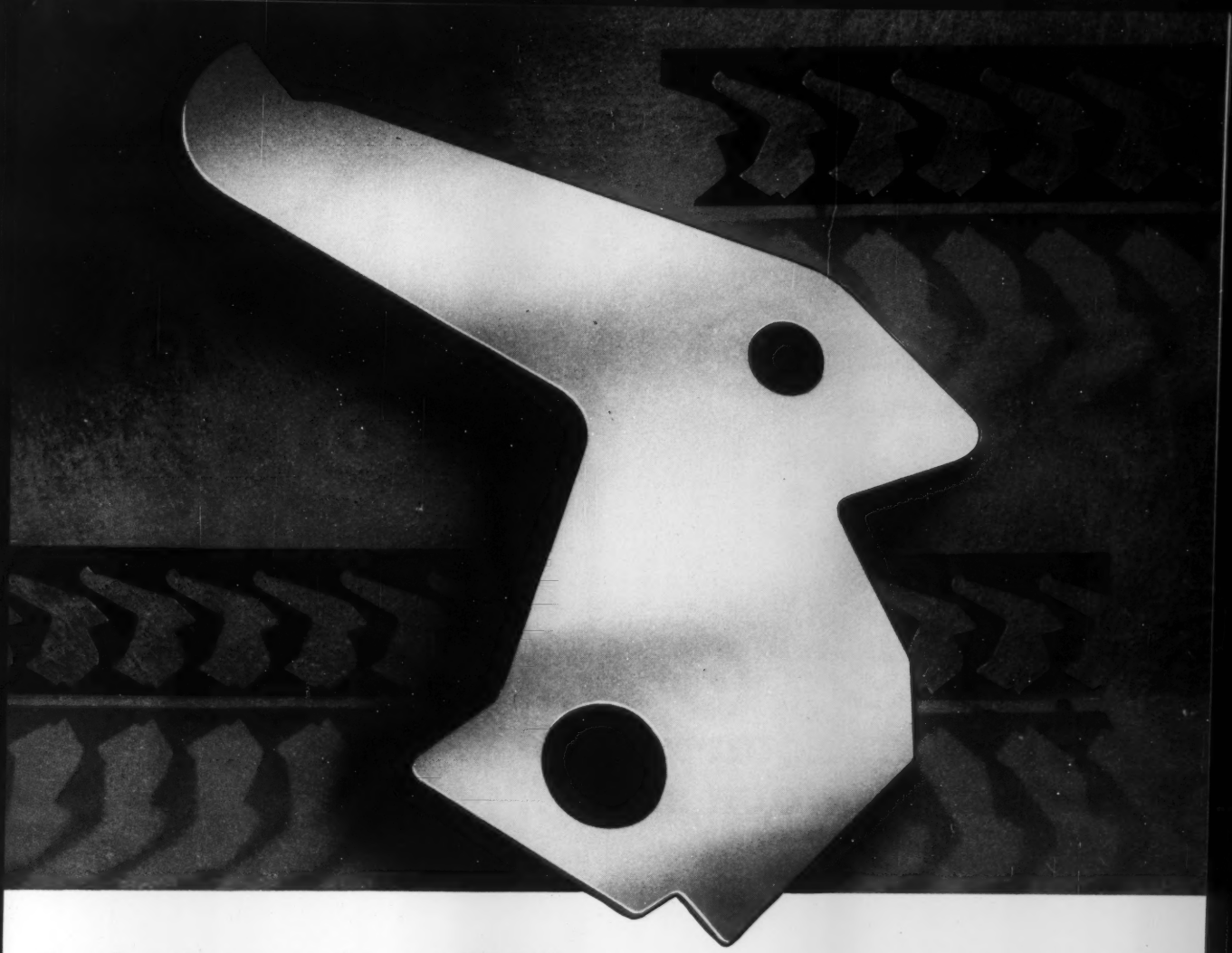
Enjoyed the article, "Motivating Men To Produce More" (June 24, page 76). I would like a copy.

J. R. Reuling
Assistant Superintendent
Boiler Division
Wilmington Works
Babcock & Wilcox Co.
Wilmington, N. C.

Lauds Roll Forging Article

Being involved in the supervision of just such an operation as described, I am interested in the article, "Roll Forge Precision Parts" (July 8, page 97). I will use this material to present to management the potentials of this operation. Please send six copies.

David H. E. Genter
Superintendent
Forge Stock
Midland Works
Crucible Steel Co. of America
Midland, Pa.



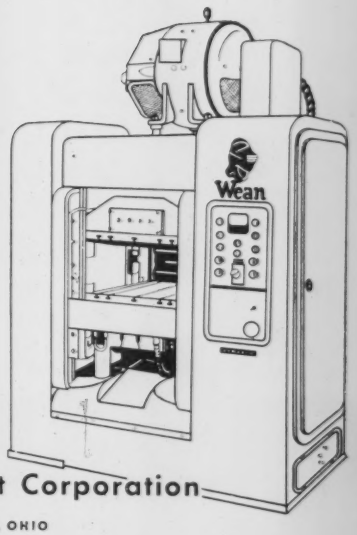
Production up almost 300% on compound pierce-and-blank operation

Production Rate: **Conventional press — 90 pieces a minute**
Wean "Flying Press" — 335 pieces a minute

The piece illustrated above is a circuit breaker cradle stamped out of .064 gauge strip steel. Length of index was 1¼". Involving a compound pierce-and-blank operation, it was produced on a conventional press at the rate of 90 parts per minute at the Westinghouse plant in Beaver, Pennsylvania. Using the same dies in a 60-20-36 "Flying Press", Westinghouse increased production to 335 parts per minute.

Speed, however, is only one phase of the "Flying Press" story. Automatic operation, centrally located controls, greatly reduced maintenance — all combine to make this the most remarkable press development since the turn of the century.

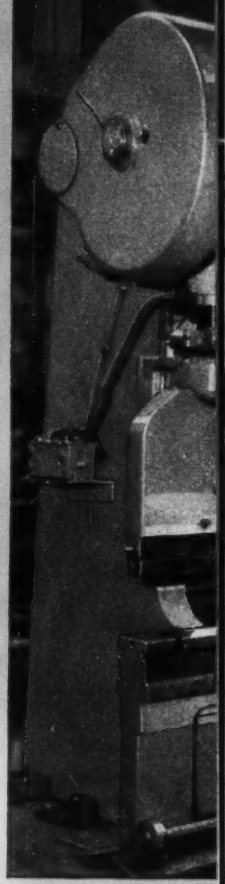
The whole story is covered in detail in the Wean "Flying Press" Brochure. Write for it today.



Wean Equipment Corporation
CLEVELAND 17, OHIO

BLANKING | PROGRESSIVE BLANKING | COMPOUND PIERCE-and-BLANK | PROGRESSIVE DRAWING | PROGRESSIVE FORMING

Forming of steel door center panel - an intricate operation.



Photos courtesy the Steelcraft Manufacturing Company, Cincinnati, Ohio.

"CINCINNATI EQUIPMENT IS THE BEST IN OUR SHOP..."

Quote from **The Steelcraft Mfg. Co.**
Cincinnati, Ohio

"We found Cincinnati equipment to be the best in our shop. Press Brake and Shear operations are very accurate. The Cincinnati machines are easy to operate and require a minimum of maintenance and are constantly in use.

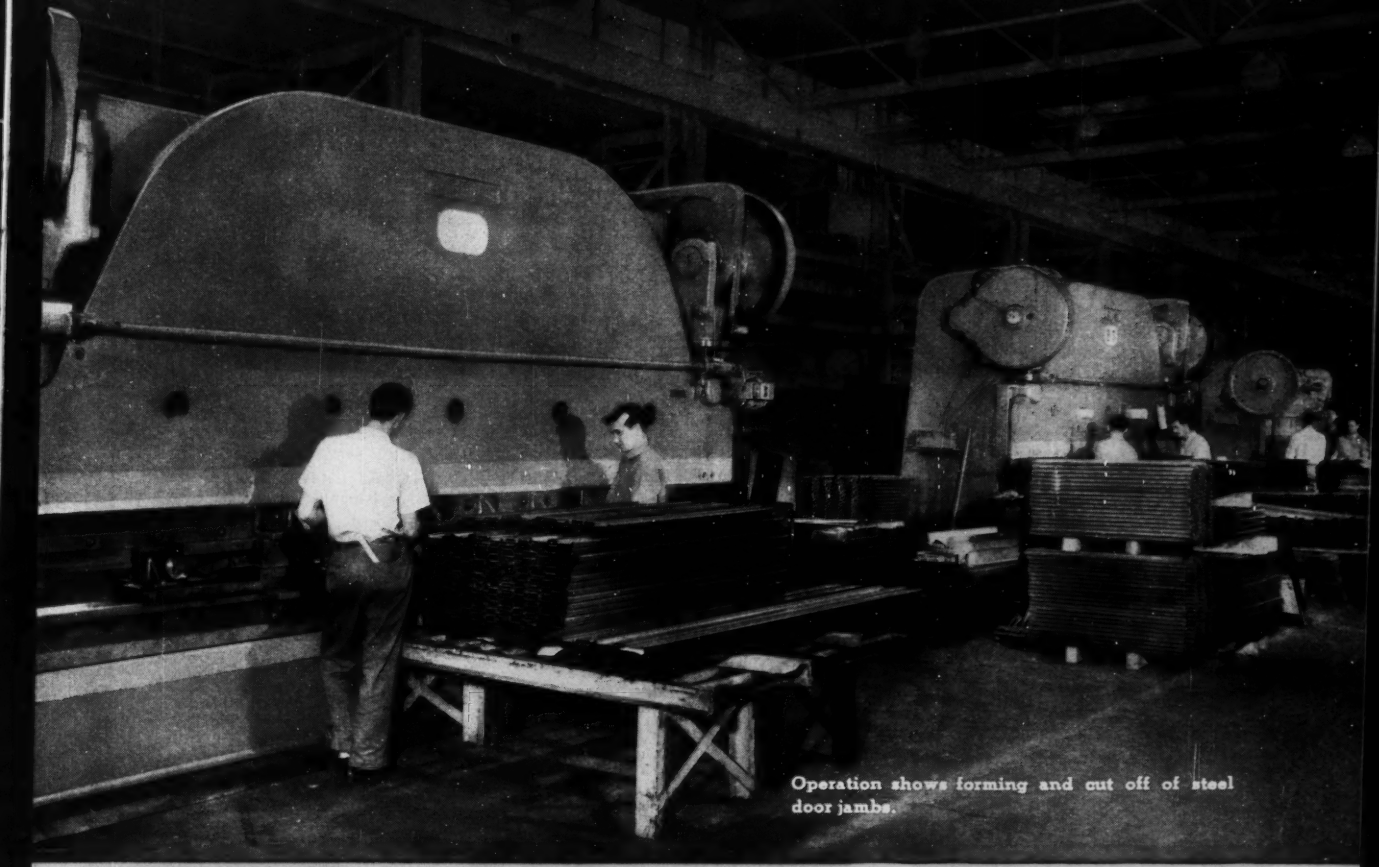
The 10 Cincinnati Press Brakes and 4 Cincinnati Shears produce parts for a number of different end products. These precision products are such that the parts must be very accurately sheared, formed and punched in order for assembly to go smoothly. Principal products whose parts are made on these machines are steel doors and frames, steel sliding and folding closet doors, and pre-engineered standard steel buildings."

The above statement from a Cincinnati user indicates satisfaction. Do you have production problems that involve Shears or Press Brakes? We suggest you consult our Application Engineering Department.

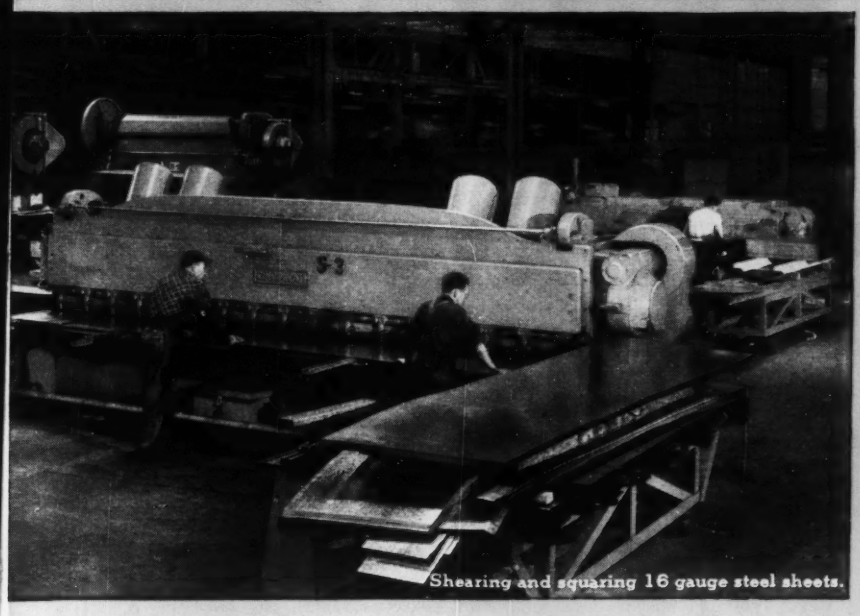
CINCINNATI

THE CINCINNATI SHAPER CO.

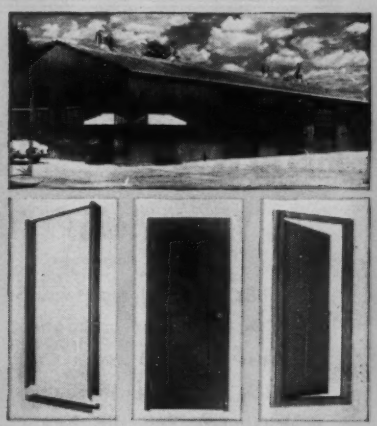
CINCINNATI 25, OHIO, U.S.A. SHAPERS · SHEARS · PRESS BRAKES



Operation shows forming and cut off of steel door jambs.



Shearing and squaring 16 gauge steel sheets.



Sides, roof, frame of standard building, door frames and panels are all sheared, formed and punched on Cincinnati machines.

Write Department C for new Cincinnati Press Brake Catalog B-5.

For Shear information, write Department C for Cincinnati Shear Catalog S-7R.

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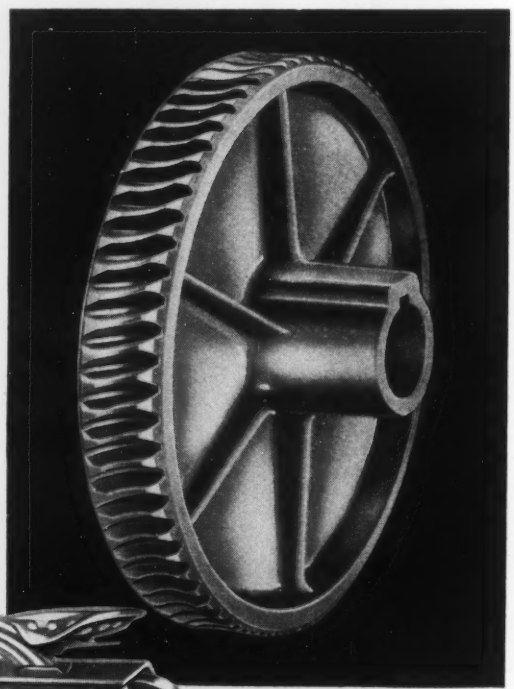
toughness of MUELLER BRASS

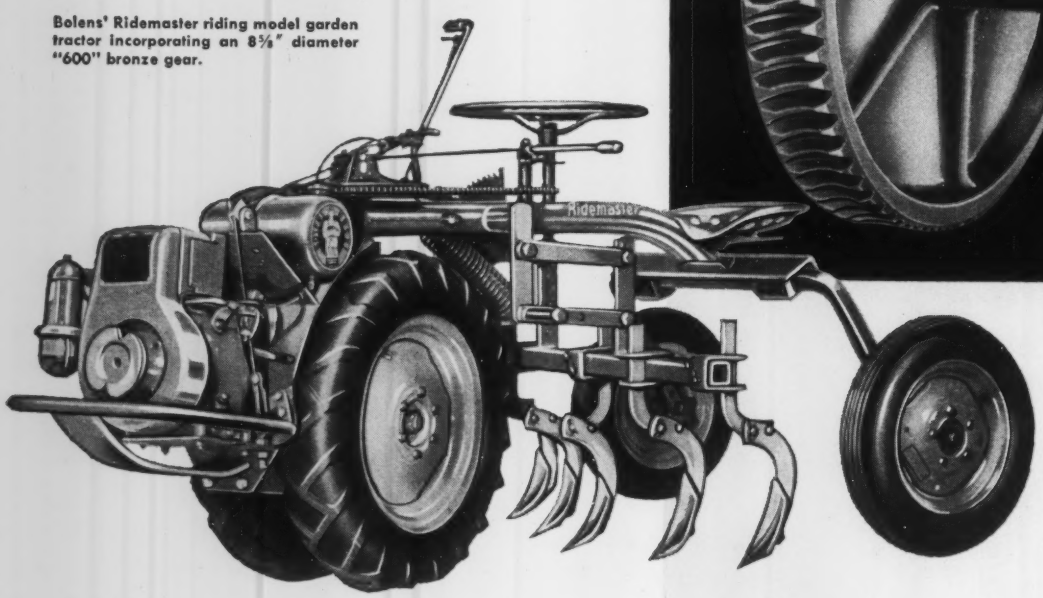
"600" series bronze alloys

Forged bronze gears made from tough, long-wearing Mueller Brass Co. "600" bearing alloy are proving their ability to withstand punishment in the popular outdoor power equipment manufactured by the Bolens Products Division of Food Machinery and Chemical Corporation, Port Washington, Wisconsin. The Junior and Super Mustang rotary tillers, all employ "600" main drive gears to dependably transmit engine power to drive assemblies. The going is rough for equipment of this type in cultivating or tilling heavy soil—but Bolens has a record for ruggedness and, on these and many other Bolens products as well, Mueller Brass Co. "600" gears help make possible that fine performance.

Mueller Brass Co. "600" bearing bronzes are available as forgings, or in rod form. They provide unusually high tensile strength, a dense structure, good resistance to corrosion, and excellent bearing properties. Because of their good machining qualities, the "600" series bronzes can be finished readily—usually at substantial savings in COST.

It will pay you to investigate these alloys for your products . . . why not write today for full information.

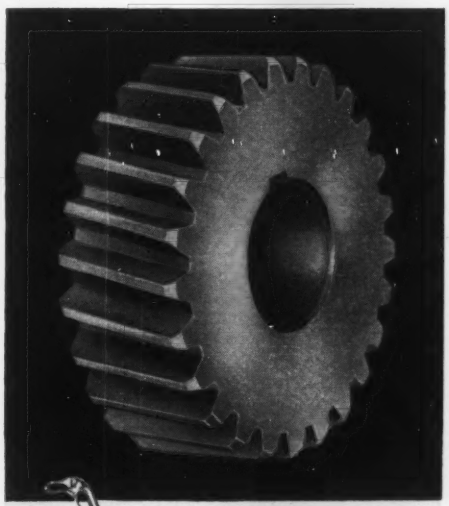




Bolens' Ridemaster riding model garden tractor incorporating an 8⅜" diameter "600" bronze gear.

and TILLERS prove

CO.



Bolens' Super Mustang rotary tiller incorporating a 25-tooth "600" series bronze worm gear.

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40 OUR 40TH YEAR MUELLER BRASS CO. 1917-1957

MUELLER BRASS CO.

PORT HURON 26, MICHIGAN

METALS AND ALLOYS REVIEW

by FRANK M. LEVY

Vice-President and Director of Research

One of the most interesting things about our 600 series bearing alloys is the great variety of products in which they find application. In the advertisement to the left you can see how the Bolens people put 600 gears to work in their rotary tillers and garden tractors. Those gears are big, take a lot of abuse, and meet the job needs perfectly. We also make a lot of small parts, too, that have been specified because of the many unusual properties of this series of alloys.

One good example that comes to mind is a shaft bushing on a rotary selector switch that we make for an instrument manufacturer. This selector is used for switching sound-powered telephone circuits aboard Naval vessels. One of the most important considerations in the choice of 600 alloy for this bushing was its resistance to abrasive action on and against a rubber "O" ring. The acceptance test required a stainless steel shaft riding in the bushing to rotate "dry" for a minimum of 50,000 cycles consisting of 360° rotation clockwise followed by a 360° rotation counter-clockwise. The "O" ring must still form a watertight seal at the end of the test. Our 602 alloy was the only one of several materials tested that met the specs. That was pretty good evidence in itself of resistance to abrasion, but, in addition, this customer also found that the use of 602 eliminated the headaches they previously had with seizing and galling.

The pounding action caused by the indexing mechanism attached to the shaft used to give them no end of seizing troubles. The chief product engineer is extremely happy about the way our alloy is performing. Mention was also made of the fact that the corrosion resistance of 602 was mighty impressive. In this application, the alloy passed the 200-hour Navy salt spray test with flying colors.

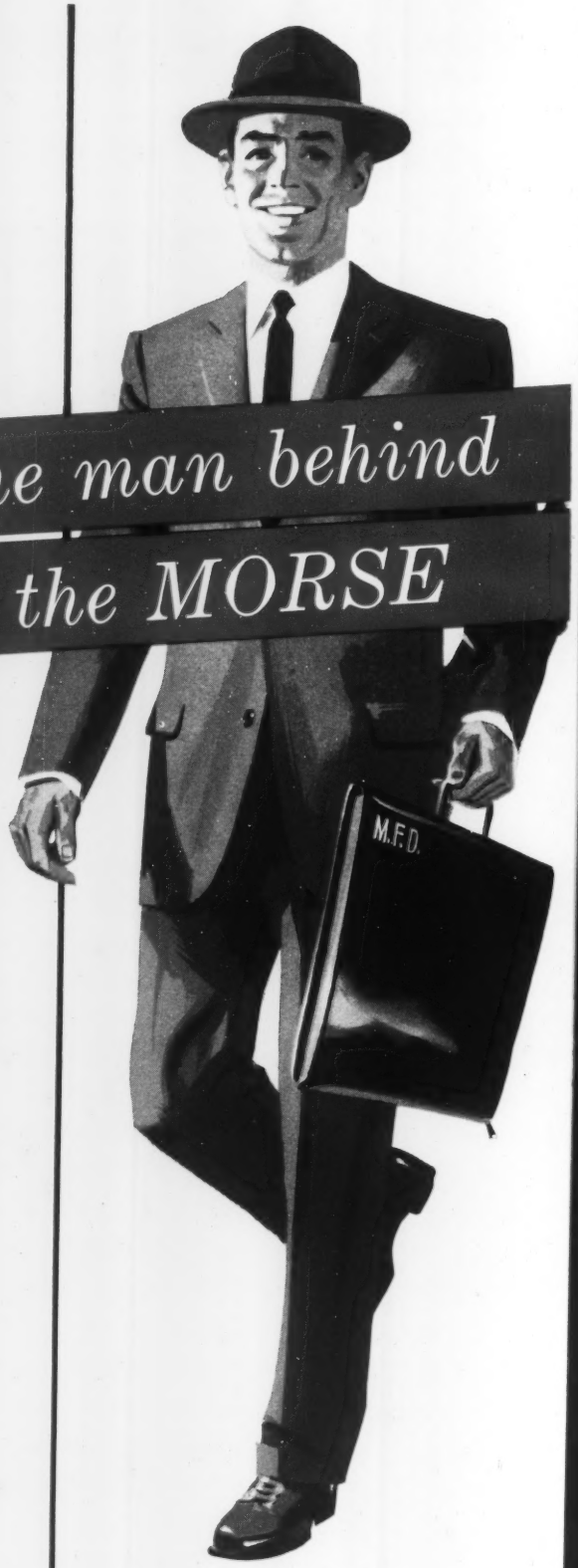
So, big or small, it seems that there is no end of applications for 600 series alloys. We even have parts working in a machine that slices frankfurters as well as gears in fishing reels. So, it seems that 600 runs the gamut from "red hots to reels". Well, it looks like the end of the page is here again, so I'll close for now. However, if you have any problems or questions about non-ferrous alloys or you're having trouble getting desired performance from a part, why not drop me a line here in Port Huron, and possibly I can be of some service. Send a part print along if you like, and we'll be glad to make proper recommendations.

Thanks again for your time.

Your friend
indeed
when you're
in need...

the man behind the man behind

...the MORSE



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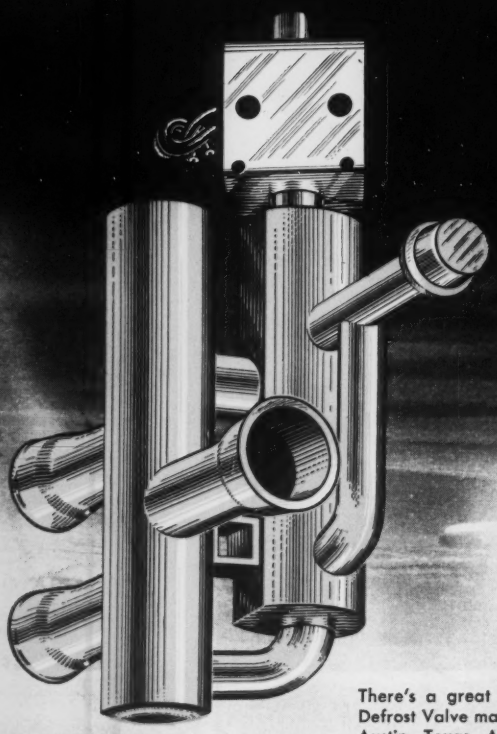
EXPERTS SAID: *"It can't be done"*



There's a great future ahead for this Heat Pump Defrost Valve made by CHATLEFF VALVE & MFG. CO., Austin, Texas. And Chase helped pave the way!

. . . but CHATLEFF and CHASE did it!

The heart of a heat pump is this refrigerant transfer valve—and it's tough to produce! But Chase technicians helped the Chatleff Valve Co. solve these problems:

To give the necessary ruggedness, corrosion-resistance and high density, Chase supplied a specially controlled alloy of leaded brass tube shapes. To cut scrap loss and machine time, they were made to extremely close tolerances. And all tube shapes received a closely controlled anneal to prevent subsequent warping. To minimize distortion, Chase created ideal conditions for welding alloys of varying thicknesses, a severe operation.

In fact, Chase did what experts called "impossible": helped set up a single furnace-brazing operation for 13 simultaneous welds! Now this Chatleff valve body is being mass-produced as a single unit ...with great efficiency and economy. Maybe Chase can help *you*, too!

Bring your production problems to... Chase®

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CALENDAR
OF MEETINGS

Aug. 12-15, Society of Automotive Engineers: West coast meeting, Olympic hotel, Seattle. Society's address: 485 Lexington Ave., New York 17, N.Y. Secretary: John A. C. Warner.

Aug. 20-23, Western Electronic Show & Convention: Cow Palace, San Francisco. Information: WESCON, 342 N. LaBrea, Los Angeles 36, Calif.

Aug. 28-30, American Institute of Electrical Engineers: Pacific general meeting, Chinook hotel, Yakima, Wash. Institute's address: 33 W. 39th St., New York 18, N.Y. Secretary: N. S. Hibshman.

Sept. 8-11, National Metal Trades Association: Eastern plant management conference, Essex-Sussex hotel, Spring Lake, N.J. Association's address: 337 W. Madison St., Chicago 6, Ill. Secretary: Charles L. Blatchford.

Sept. 9-11, American Mining Congress: Metals mining and industrial minerals convention, Utah and Newhouse hotels, Salt Lake City, Utah. Congress' address: 1102 Ring Bldg., Washington 6, D.C. Executive vice president and secretary: Julian D. Conover.

Sept. 9-12, Society of Automotive Engineers: Tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N.Y. Secretary: John A. C. Warner.

Sept. 9-13, Instrument Society of America: Annual instrument - automation conference and exhibit, Public Auditorium, Cleveland. Society's address: 313 Sixth Ave., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 12-14, Automotive Parts Rebuilders Association: Annual meeting and exhibit, Congress hotel, Chicago. Association's address: 220 S. State St., Chicago 4, Ill. Executive secretary: Jack O'Sullivan.

Sept. 17-18, Electronics Industries Association: National technical machine tool automation meeting, Ambassador hotel, Los Angeles, Calif. Association's address: 1721 DeSales St. N.W., Washington 6, D.C. Secretary: James D. Secrest.

Sept. 17-20, American Die Casting Institute: Annual meeting, Edgewater Beach hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N.Y. Secretary: David Laine.

Sept. 18-20, National Industrial Conference Board: Marketing meeting, Waldorf-Astoria hotel, New York. Board's address: 460 Park Ave., New York 22, N.Y. Secretary: Herbert S. Briggs.

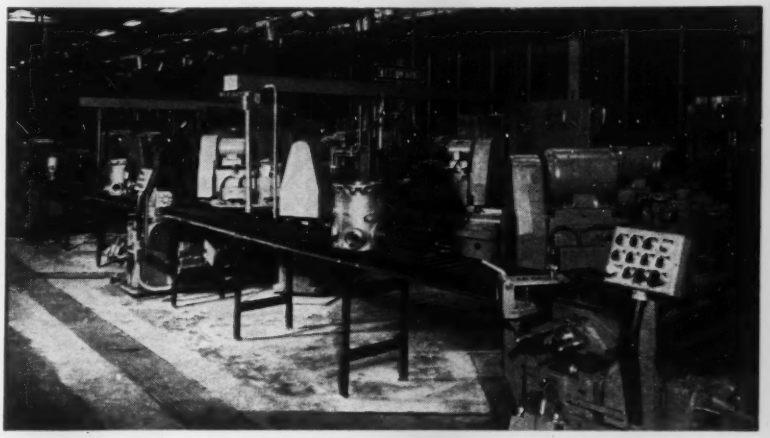
Sept. 20, Malleable Founders' Society: Fall meeting, Hotel Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Executive vice president: Lowell D. Ryan.

Sept. 21-24, Steel Founders' Society of America: Fall meeting, Homestead, Hot Springs, Va. Society's address: 606 Terminal Tower, Cleveland 13, O. Secretary: George K. Dreher.

Sept. 22-24, American Machine Tool Distributors Association: Annual meeting, Hotel Cleveland, Cleveland. Association's address: 1900 Arch St., Philadelphia 3, Pa. General manager: James C. Kelly.

Sept. 22-25, American Institute of Wholesale Plumbing & Heating Supply Association Inc.: Annual meeting, Waldorf-Astoria hotel, New York. Institute's address: 402 Albee Bldg., Washington 5, D.C. Executive secretary: George T. Underwood.

Ask Standard ... how to cut costs with conveyors



Standard gravity roller conveyors like this are modest in cost, easy to install and maintain.

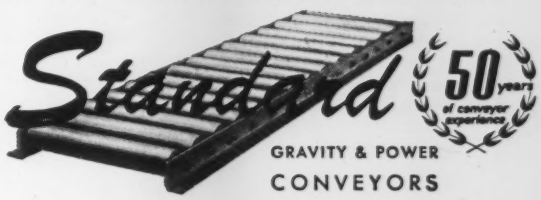
Conveyor system helps Airtemp up compressor parts production 40%

To handle stepped-up demands for residential and industrial air conditioners, the Airtemp Division of the Chrysler Corporation undertook an extensive re-tooling program. On one compressor crankcase line, for example, they installed 17 new machine tools . . . connected them all with Standard gravity roller conveyors. Result — two hours saving per case, production up 40%.

If you're planning on modernizing or retooling it will pay you, too, to find out how Standard conveyors can complement new equipment . . . give you lower overall costs and greater productive efficiency. STANDARD CONVEYOR COMPANY, North St. Paul 9, Minnesota. Sales and Service in Principal cities.

For details — contact the Standard representative listed in the classified phone book or write direct. Ask for Bulletin 1-8.

To expedite shipping or stocking and reduce handling costs, investigate Standard lightweight portable roller conveyors (right) or the portable, self-powered HANDIBELT conveyor (left), which can be used horizontally or at varying incline or decline angles.



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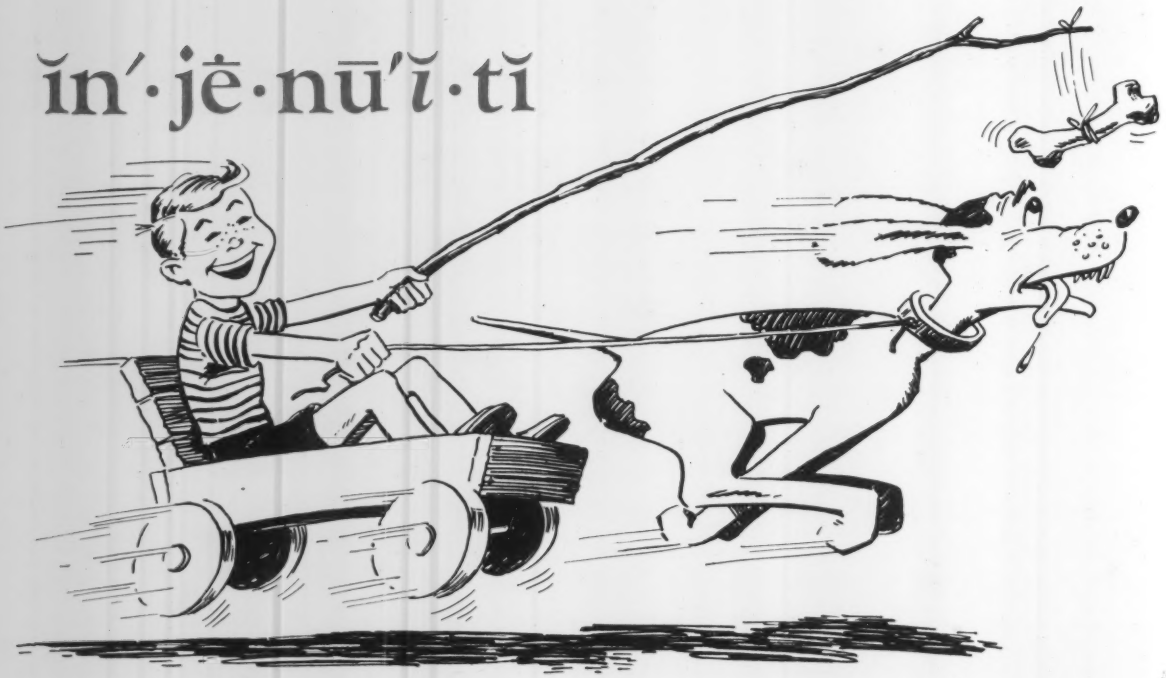


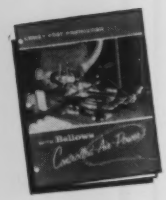
the real way to spell AUTOMATION

Boiled down to its fundamentals automation only means imparting automatic operation to repetitive production processes. It can cover a single machine as well as an entire production line.

Most of the needs of automation can be met by relatively simple controls plus a healthy helping of old fashioned ingenuity.

For example, we manufacture a series of electrically controlled air-powered work units. With one or more of these devices you can convert a wide range of standard machines and machine tools to fast automatic units. Or you can use them to form the basis of inexpensive, tool-room-built special purpose machines.

It doesn't matter what you make — how big or small your operation — you'll find Bellows "Controlled-Air-Power" Devices will play for themselves quickly — often before the due date of the invoice we'll send you.



This booklet interesting. Write for it.

Bulletin ML-3 — the quick story of what Bellows can do for you.

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In Canada: Bellows Pneumatic Devices of Canada, Ltd., Toronto, Ont.

The Bellows Co.

AKRON 9, OHIO

Manufacturers of Air Powered Work Units: Air Motors, Air Cylinders, Air Hydraulic Controls, Work and Tool Feeding and Holding Devices. Field Engineer Offices in all principal cities and industrial areas in the United States and Canada.

759-B

He moves a 30-oz. lever; the Gerlinger moves 30,000 lbs.

Where extra power is needed to lift, move and stack capacity loads up to 40,000 pounds, Gerlinger giants like this one do the job like no other fork lift trucks built. And do it with instant fingertip control!

More and more industrial plants, mills and foundries are finding out that top production and profits go hand-in-hand with the mass-handling efficiency you get with a job-proved Gerlinger.

You'll see your investment pay off almost immediately—made possible through Gerlinger features like these:

- *Pivotal-mounted steering assembly* —stabilizing load on any road
- *One-lever lift-tilt control* —positioned for safer operation
- *Counter-active weight distribution* —better traction, maneuverability
- *Heavy-duty steel channel frame* —bonus years of reliable service
- *Maximum-power torque converter* —smoother driving, less wear

New records of production and profit are the usual report when Gerlinger Fork Lift Trucks are on the job. Get latest catalog and see the many ways you will benefit. Write Gerlinger Carrier Co., Dallas, Oregon.

Leaders for 38 years in building Fork Lift Trucks and Carriers

TOWMOTOR - GERLINGER
THE ONE-MAN GANG

Gerlinger Carrier Co., Dallas, Oregon, is a subsidiary of Towmotor Corporation, Cleveland, Ohio

KIDDE'S NEW DRY CHEMICAL EXTINGUISHER.

EASIEST, FASTEST WAY TO KILL FIRE!

Here – from Kidde – is the newest, the fastest, the easiest-to-operate dry chemical fire extinguisher.

Look at the extra large, aluminum handle and trigger – even a gloved hand fits comfortably with room to spare. Pick the unit up – it hangs straight – no awkward angle to throw you off balance.

If fire strikes, follow the simple directions: "Remove Horn" – automatically the trigger safety lock is released – "Pull Trigger" – instantly a cloud of fire-killing dry chemical whooshes out of the nozzle and fire's out! With this unit, designed by Kidde engineers working with Henry Dreyfuss personnel, you don't have to be a trained fireman to get perfect results.

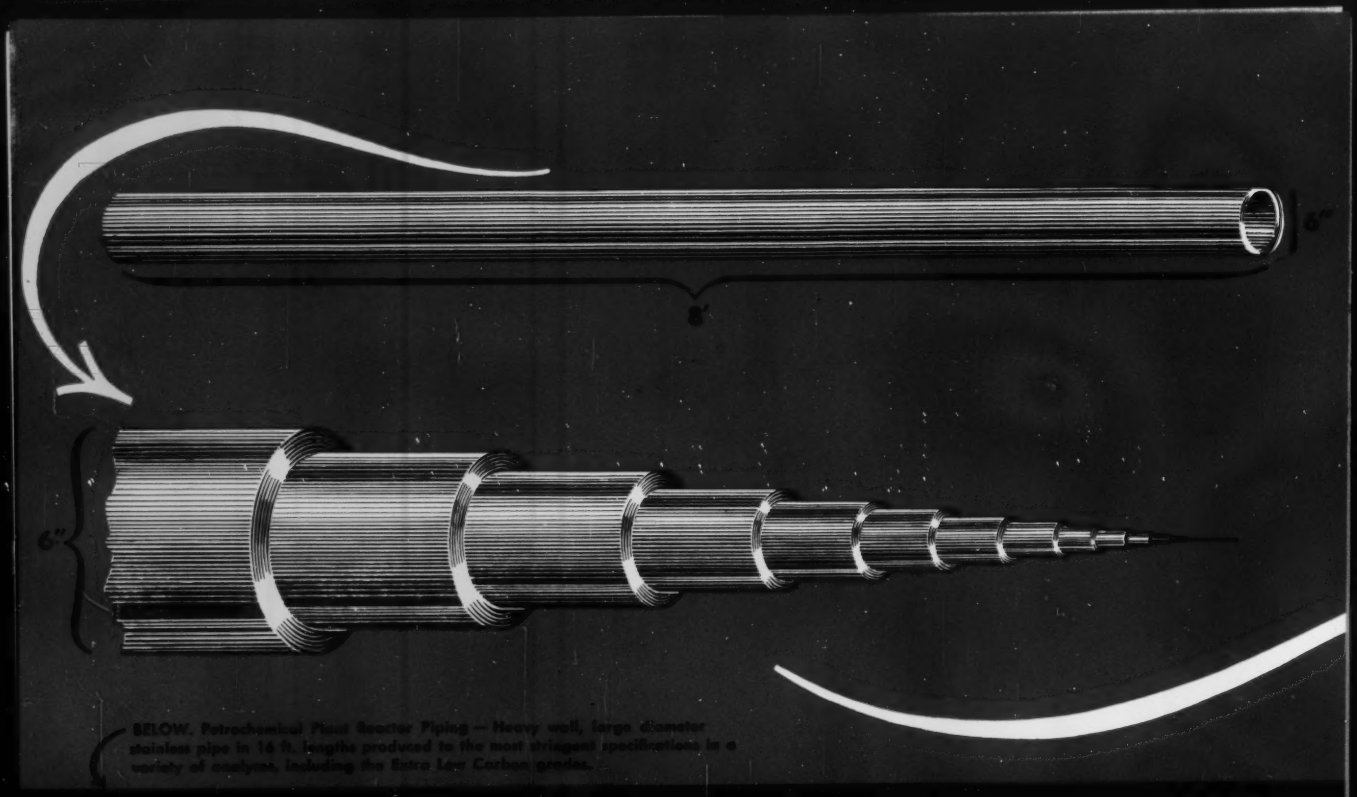
Built for a lifetime of use, the handsome new 20 and 30 pound Kidde dry chemical extinguishers have top ratings from Underwriters' Laboratories, require only 225-250 psi charging pressure. The rugged pressure gauge is recessed in handle for maximum protection. Tells at a glance if the unit is ready for use.

Available nationally through Kidde's sales and service organization. Write Kidde today for the name of nearest distributor.

Walter Kidde & Company, Inc., 860 Main St., Belleville 9, N. J.

Walter Kidde & Company of Canada Ltd., Montreal – Toronto

Kidde



BELOW. Petrochemical Plant Reactor Piping — Heavy wall, large diameter stainless pipe in 16 ft. lengths produced to the most stringent specifications in a variety of analyses, including the Extra Low Carbon grades.

UNITED STATES PIPE & FOUNDRY CO.

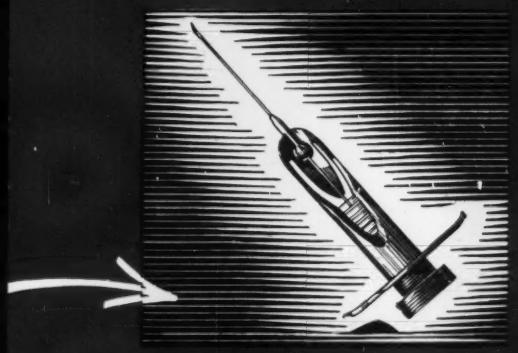
Steel and Tubes Division

STEEL & TUBES U.S. PIPE DIVISION

BURLINGTON, NEW JERSEY

SALES OFFICES: LOS ANGELES, SAN FRANCISCO, CHICAGO, ST. LOUIS, COLUMBUS, DETROIT, PITTSBURGH, HARTFORD, BURLINGTON

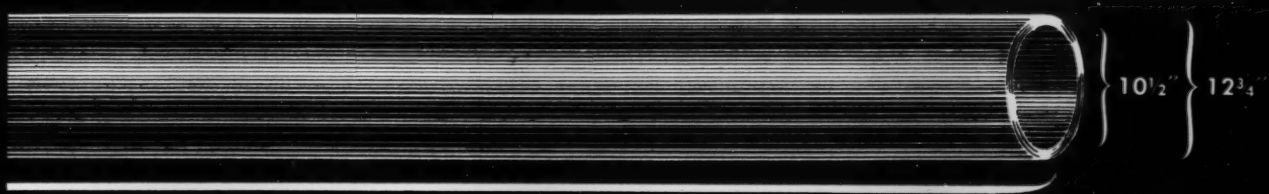
3 PROBLEMS
each different
1 SOLUTION...
stainless steel
Centrifugal Castings

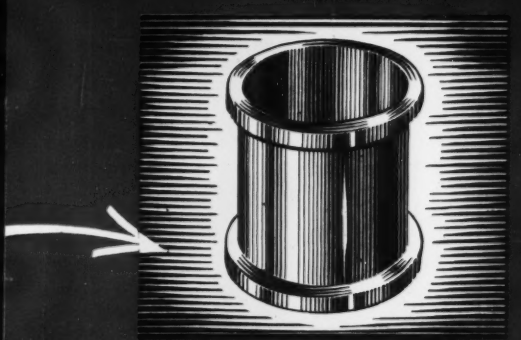


Hollow Billets for cold reducing into small diameter seamless tubing, even down to hypodermic needles—ultimate proof of metal soundness! Many so-called non-pierceable grades of pipe and tubing can be hot or cold reduced from centrifugally cast billets.

Heavy Wall stainless steel pipe, centrifuge bowls, hollow billets for finely drawn hypodermic needle tubing . . .

These are among the many end uses for metal mold centrifugally cast cylindrical shapes. They are typical of the exacting, difficult service conditions to which this product is subjected. All three examples shown demonstrate the fundamental versatility of this manufacturing process—unequaled product soundness—from hypodermic needle stock subjected to the repeated stresses of cold reduction, to the centrifuge bowl spun





Centrifuge Bowl Shells produced from multiple length sections and machined to shape desired.

at 1800 RPM, to the petrochemical plant reactor piping that must pass hydrostatic pressure tests equal to 90% of the Yield Strength of the metal. These are the proving grounds of quality—of the ability to meet even the most exacting of product specifications.

We welcome your inquiries. For descriptive literature on the versatile metal mold process, write to United States Pipe and Foundry Company, Steel and Tubes Division, Burlington, N. J.

Study these advantages for your cylindrically-shaped products

- Reduced processing time and increased production.
- Design of parts to suit the specific job requirements by selecting the correct alloy — not the next best available alternate.
- Conservation of expensive metals and alloys — especially on tubular parts now produced from solid sections.

SIZE RANGE AND COMPOSITION FLEXIBILITY

Outside Diameter—6" to 50"
Wall Thickness—⅜" and up
Length—Up to 16'
Types of Stainless—All Standard AISI and ACI grades of ferritic and austenitic stainless, including No. 20 Alloy, 17-4 P H, 17-7 P H and E.L.C. grades.

With Norton barrel-finishing abrasives and methods

Manufacturer Saved Over $90,000 First Year

A prominent aircraft parts manufacturing company reports the following savings — typical of very many — gained by shifting from hand-finishing to Norton TUMBLEX* abrasives and barrel-tumbling techniques:

Number of Parts	Cost of Hand-Finishing	Cost of Barrel-Finishing	SAVINGS
312,906	$.1149	$.0207	$29,475.75
30,724	.091	.013	2,692.42
25,599	.114	.014	2,559.90
25,685	.100	.012	2,260.28
9,347	.103	.020	770.50

Total savings for all parts — including many more made by this single company — amounted to well over $90,000 the first year and is increasing steadily.

This is just one example of the amazing economy forward-looking firms are chalking up by converting to the know-how and materials Norton offers to all industry.

Your own metal parts can range from tiny needles to hefty forgings. They may be simple or complicated, hard metals or soft. Whatever they require, deburring, descaling or finishing to close tolerances — here's what you need to cut these operations to lowest cost.

Thorough knowledge of the right size, type and shape of tumbling abrasives to use, and just how to use them.

You can get these "Touch of Gold" advantages from Norton. Just send sample parts to our Sample Processing Department and you'll be forwarded finished parts with complete facts as to abrasives, methods and equipment. Or write for further information to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors all around the world.

G-327

NORTON
ABRASIVES

Making better products . . . to make your products better

NORTON PRODUCTS:
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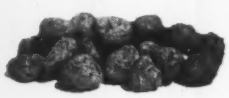
*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries

ALUNDUM* TUMBLEX "S". Bonded spheres that get into areas where other shapes can't reach. Exceptionally dense and long lasting. Five sizes.

ALUNDUM TUMBLEX "T". Bonded, triangular and fast-cutting for special shaped parts. They won't wedge in work slots or holes. Four sizes.



ALUNDUM TUMBLEX "A". For general barrel-finishing. Removes flash, scale, tool marks and burrs, while forming radii and finishes to required microinches. Twelve sizes.

TUMBLEX "N". Natural stones, exclusively Norton. For high lustre, especially on die castings and soft metal. Rounded shape brings up highest lustre. Seven sizes.

NOTHING *can equal Stainless Steel*

in its unique combination of properties

No other design material can match Stainless Steel in its combination of desirable properties: corrosion resistance, strength, hardness, beauty, cleanability and easy fabrication. For a reliable source of supply, United States Steel offers you the widest range of types, finishes and sizes.

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COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH
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USS STAINLESS STEEL

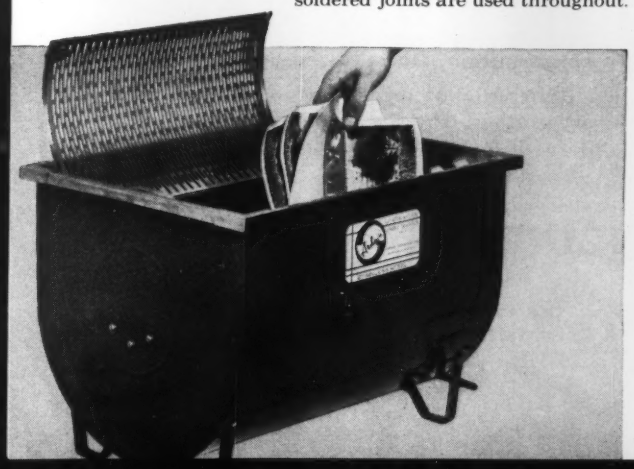
SHEETS · STRIP · PLATES · BARS · BILLETS
PIPE · TUBES · WIRE · SPECIAL SECTIONS

USS

UNITED STATES STEEL

FOR HIGH TEMPERATURE STRENGTH. The Ryan Firebee is a pilotless jet airplane that flys about 600 mph at altitudes up to 40,000 feet. All three armed services are using it for target practice—to simulate attacking aircraft. Fuselage and turbojet engines use substantial quantities of Stainless Steel—mostly because of its excellent strength/density ratio at elevated temperatures.

FOR CORROSION RESISTANCE. If you're a photographer, you know that hypo is awfully corrosive. This print washer (it holds 75 8x10 prints in one loading) is made completely from Stainless Steel by the Arkay Corporation, in Milwaukee. For proof that Stainless is easy to fabricate, notice that the drum has 1,700 perforations, and double lockseam soldered joints are used throughout.



FOR TAKING A BEATING. These supermarket check-out counters are made from USS Stainless Steel. They withstand the pounding of heavy containers and are unaffected by corrosive meat and produce juices. It only takes 20 minutes for one girl to clean all eleven counters shown here. The Robert Becht Company of Cincinnati made them.

I call KE for plant expansion or new facilities

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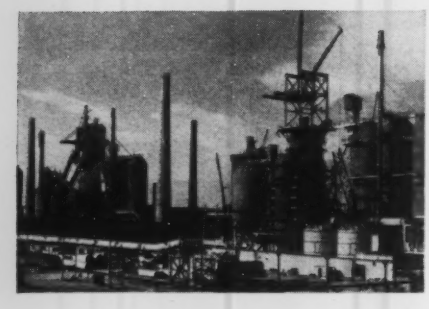
N U I T Y

has made KE a major engineer-contractor serving Steel



At India's mammoth Tata works, at Jones & Laughlin, at Kaiser Steel—Kaiser Engineers' ingenuity advances the art of making steel.

KE can take your development thoughts from a gleam in your eye through start-up. KE performs any part—economic analysis, plant location, engineering, design, procurement, expediting, construction. One contract can cover all.

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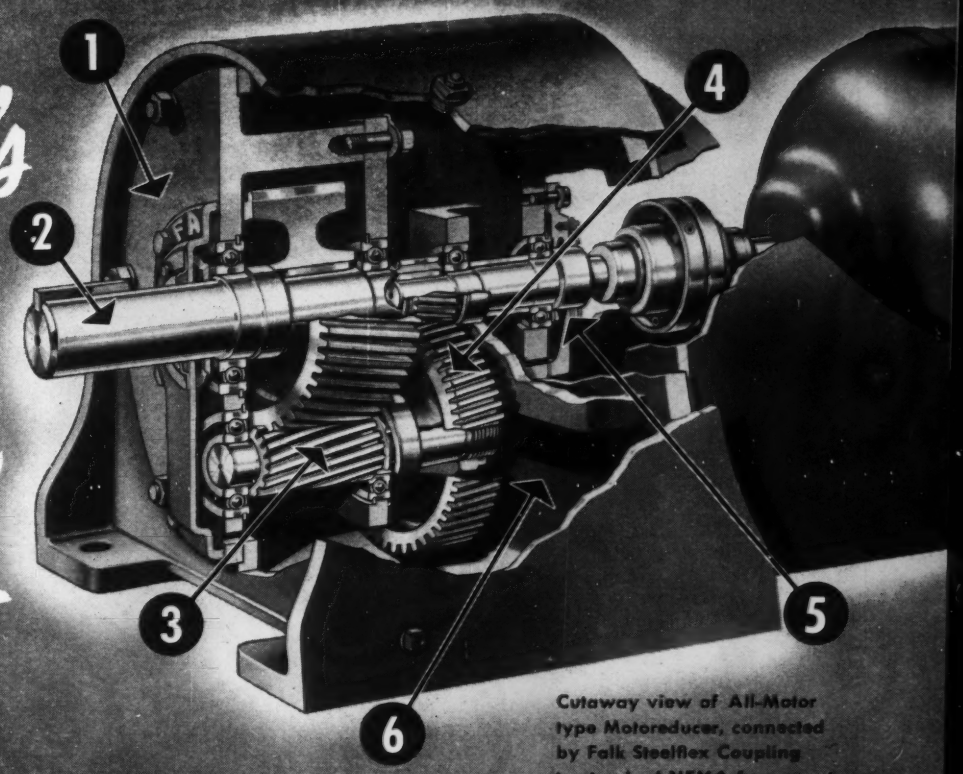
Here's the inside story—



Cutaway view of All-Motor type Motoreducer, connected by Falk Steelflex Coupling to standard NEMA frame motor

WHY Falk Motoreducers give better service—have longer life

Here is the "inside story" behind the all-steel All-Motor type FALK Motoreducer's universal reputation as a gear drive unmatched in quality, efficiency, dependability, ease of maintenance and long life. These "In-built" factors are—

1 **ALL-STEEL HOUSINGS.** Rugged, strong, rigid...all parts are manufactured from heavy steel plate, formed and welded in the Falk Weld Shop.

2 **LARGE OVERHUNG LOAD CAPACITY.** Large shafts, oversize bearings...rigid mountings with wide bearing spans to handle maximum applied loads.

3 **PRECISION GEARING.** Heat-treated alloy steel gearing, precision cut and shaved after heat treatment to eliminate distortion. Quiet, crown-shaved pinions.

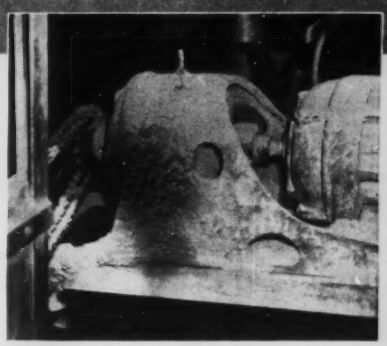
4 **EXTRA-CAPACITY GEARING.** Special extra-capacity gear-tooth form with larger contact area gives greater strength, higher load-carrying capacity.

5 **SEALED HOUSINGS.** Splashproof, dustproof, oil-tight construction. Dual closures and one-way vents keep oil in, dust and moisture out.

6 **POSITIVE LUBRICATION.** Large sump capacity...oiltight construction assures clean lubricant...revolving elements lubricated by direct dip.

When you buy or specify the All-Motor type FALK Motoreducer, you get all these—plus the tremendous advantage of full interchangeability of motors. Switch motors as desired—use any make, style or type of standard foot-mounted motor within the unit's AGMA rating—with a minimum of difficulty or "down time."

Available in sizes up to 75 hp—*with or without motor*—from convenient factory, field or distributor stocks, from coast to coast. **Write for Bulletin 3100.**



60,000 HOURS WITHOUT A FAILURE!

Sixty thousand hours is a lot of hours—but the FALK Motoreducer in the unretouched photo above has served that long without failure or need of repair.

This 3 hp unit is one of over 60 FALK Motoreducers in daily service in an Eastern plant of a large milling company, whose president says, in part:

"One of the main advantages of FALK Motoreducers is their adaptability to any motor. Reducers and motors can be easily interchanged....Our service records confirm the wisdom of our choice of FALK equipment as our standard."

FALK ...a good name in industry

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
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Meet the BIRDSBORO Roll Specialist...

...he comes to you backed by over a half century of metallurgical, engineering, and production experience. Birdsboro's long record of producing specialized steel, alloy iron, and alloy steel rolls stands behind him to give you individualized roll service. When you want the outstanding performance that means increased tonnage, call BIRDSBORO.

IRON BASE ROLLS: Grainloy, Birdsboro Metal, Curoloy, Superloy, Super Curoloy.

STEEL BASE ROLLS: Diamondite, Birdsboro Special, Birdsboro "30", "40", "50", and "75".

Designers and Builders of:

STEEL MILL MACHINERY
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STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

R-15-58

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

No matter how you say it . . .

*TRANSLATION: CUTTING OIL

The performance and the brand are the same around the world

Other Outstanding Shell Industrial Lubricants

Shell Tellus Oil—for closed hydraulic systems

Shell Alvania Grease—multi-purpose industrial lubricant

Shell Turbo Oil—for utility, industrial & marine turbines

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Shell Talona R Oil 40—anti-wear crankcase oil for diesel locomotives

Shell Dromus Oils, a quality line of soluble cutting oils, permit higher speeds and greater feeds while extending tool life. They have excellent wetting and cooling properties and are not sticky or greasy.

Dromus® Oils have the added advantage of being easy to mix in hot or cold, hard or soft water. They form emulsions which remain stable in practically any concentration required in the shop.

Today Dromus Oils are available to your customers abroad. You can be sure that they will enjoy the same efficient performance your domestic customers rely upon.

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For more information, write Shell Oil Company, 50 West 50th Street, New York 20, N. Y., or 100 Bush Street, San Francisco 6, California.

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immediate shipment . . . all ratings

General Electric TRI 55 CLAD

REG. U.S. PAT. OFF.

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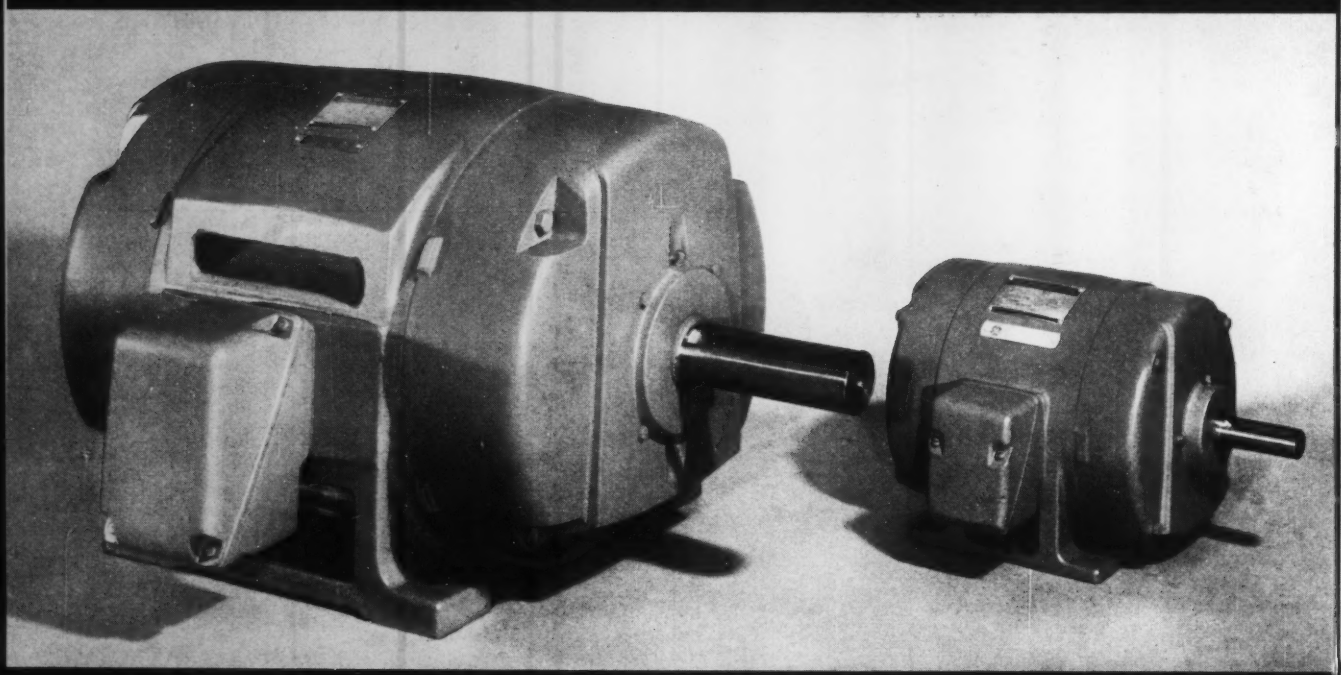
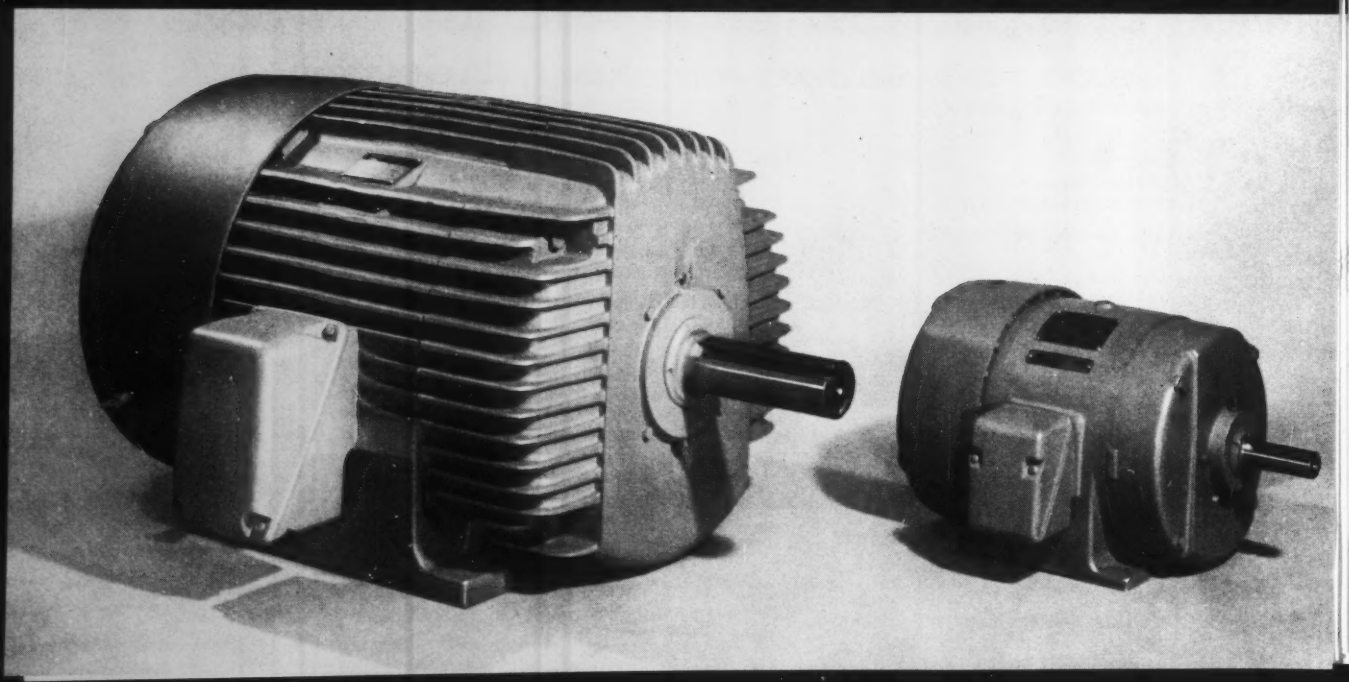


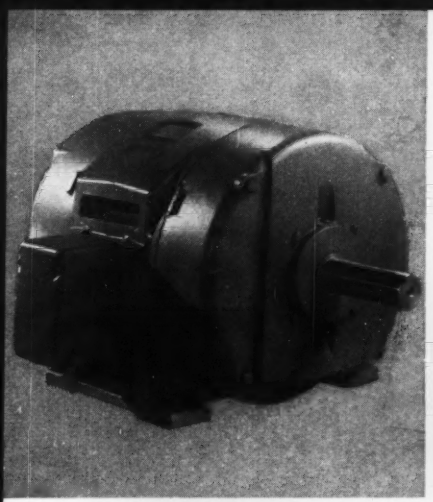
TOTALLY ENCLOSED



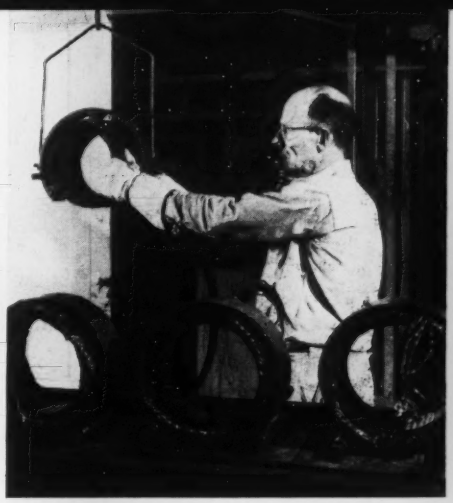
Motors in New NEMA Ratings

TO 125 HP

YEARS AHEAD BENEFITS

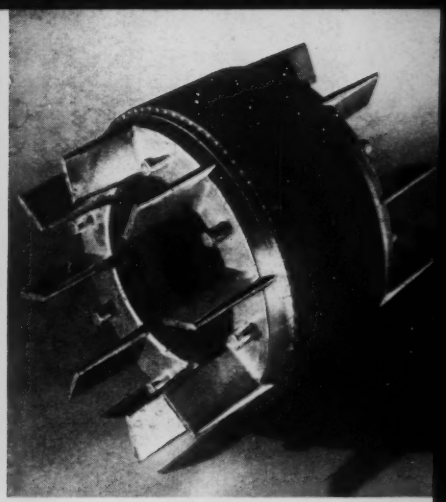


DESIGNED FOR GREATER PROTECTION—Better protected against physical damage by rugged cast-iron frame and endshields, new Tri-Clad '55' motors will handle many applications where ordinary dripproof motors cannot be applied.



BUILT TO PROVIDE LONGER LIFE—Longer stator life is provided through use of new, advanced insulation system utilizing Mylar* slot insulation, Formex® magnet wire, non-wicking Geoprene® leads and Dri-Film® silicone coating.

**Registered DuPont Co. Trade-mark.*



ENGINEERED FOR TOP PERFORMANCE—Improved rotor is solid cast from commercially pure aluminum for greater strength, higher conductivity. Integrally cast rotor fans conduct heat to air stream more effectively than separately joined fans.

FOR COMPLETE INFORMATION

FOR COMPLETE DETAILS on the new line of Tri-Clad '55' motors up to 125 hp, contact your local G-E motor distributor or the sales engineer at your nearby General Electric Apparatus Sales Office. You will get expert assistance in selecting and applying the right motor for your particular application.

FOR FREE SLIDE RULE—which lets you determine at a glance the weight and space-saving benefits of recently announced NEMA standards for larger motors—and for informative, free General Electric Tri-Clad '55' motor bulletin, please send attached coupon.

Section 891-6
GENERAL ELECTRIC COMPANY
Schenectady 5, New York

Please send me the following publications:

☐ **FREE BULLETIN** (GEA-6602) describing the many advanced features of new Tri-Clad '55' motors up to 125 hp.

☐ **FREE SLIDE RULE** (GEN-148) to determine weight and space-saving benefits of new Tri-Clad '55' motors.

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Anaconda Aluminum and

ALUMINUM COILED SHEET produced to the high standards of quality and uniformity maintained by The American Brass Company is now available for prompt shipment from our Torrington Division to all points in the United States.

It is rolled on the most modern, high-speed equipment, X-ray controlled to close tolerance in gage. High-speed, electronically operated slitters give exact widths with clean edges on evenly and tightly wound coils. Latest bell-type annealing furnaces provide high uniformity of metal structure to meet specified mechanical-property limits.

IN THESE WIDTHS: Maximum 28 inches
Minimum 3/8 inch

IN THESE THICKNESSES: Maximum 0.064 inch
Minimum .008 inch

COIL WEIGHTS: Up to 100 lb. per inch of width

ARBOR SIZES: 4, 6, 8, 10, 12, 16, and 20 inches in diameter

ALLOYS: 1100, 3003, 3004, 5005, 5050, 5052

TEMPERS: Alloy Nos. 1100, 3003, 5005
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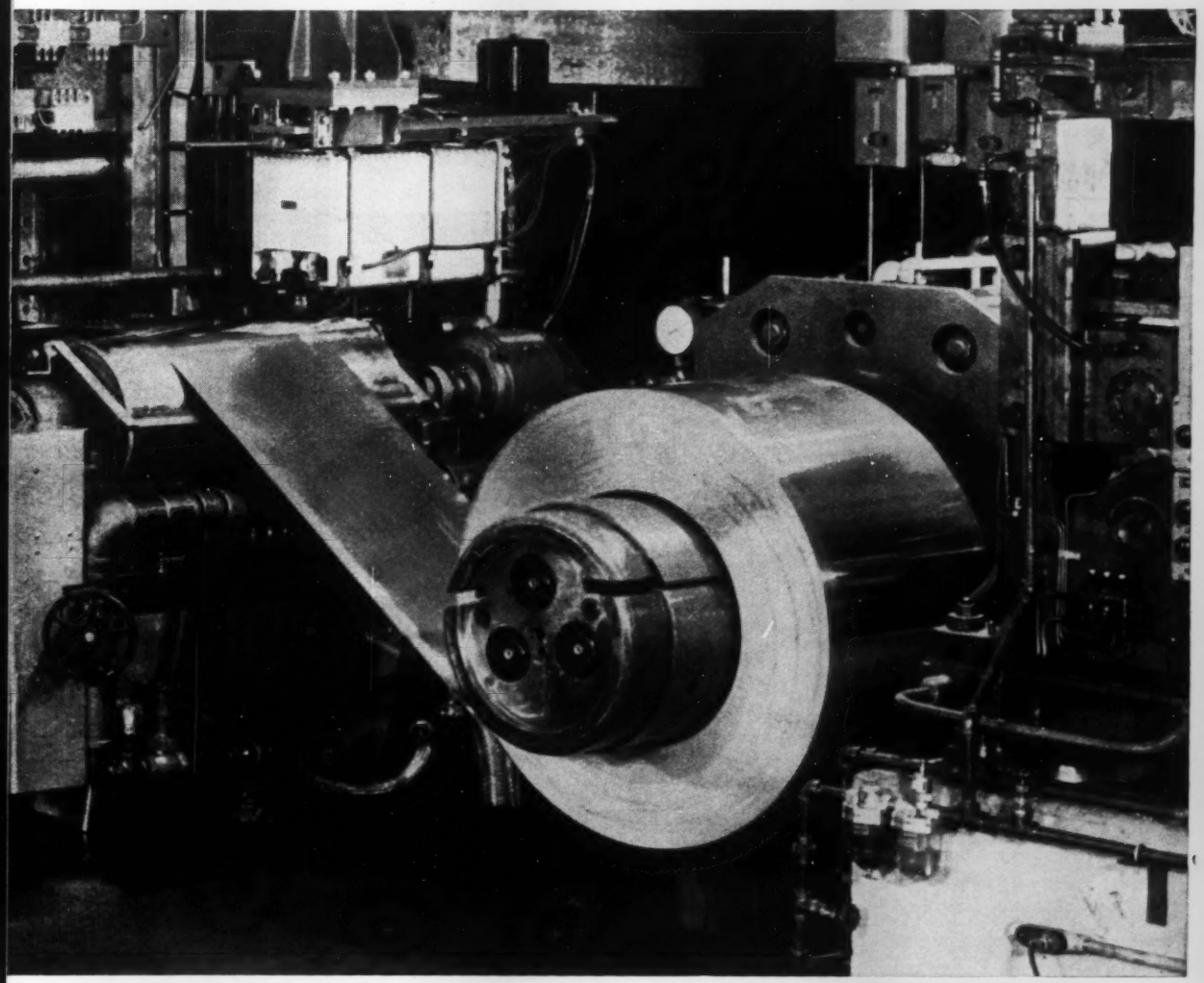
Alloy Nos. 3004, 5005, 5050, 5052
–0, –H32, –H34, –H36, –H38



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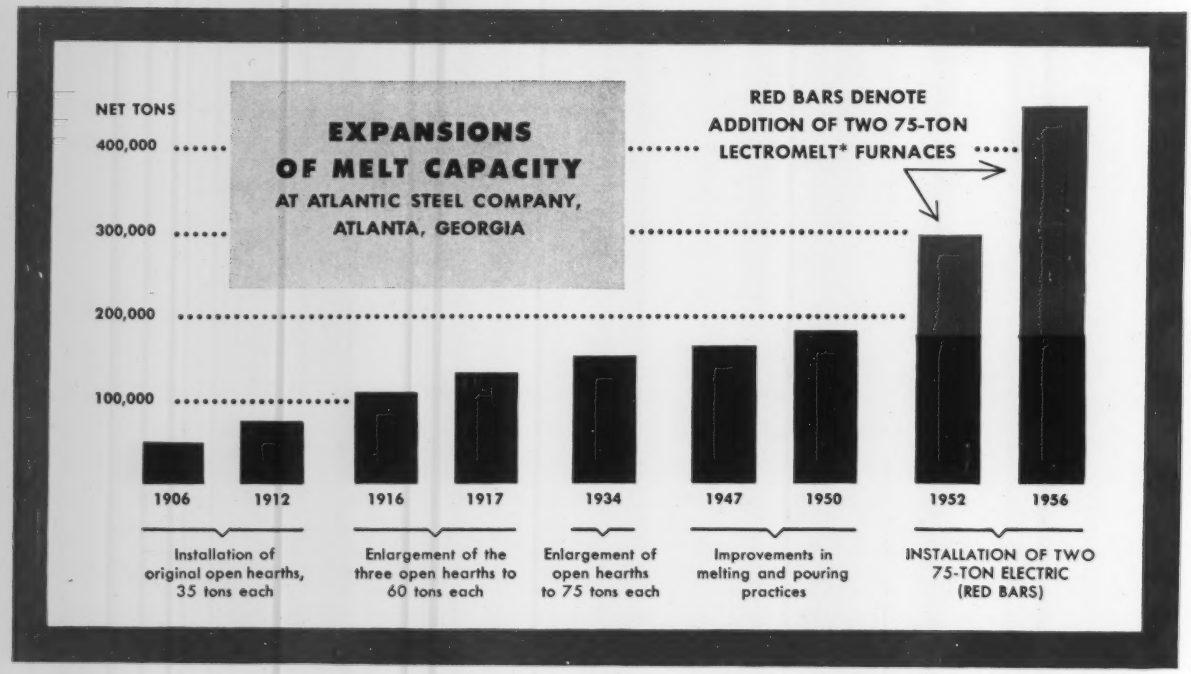
ANACONDA® ALUMINUM AND ALUMINUM ALLOY COILED SHEET

Made by The American Brass Company

ATLANTIC STEEL

compares open hearth and electric furnaces



For equivalent open hearth capacity:

Electric furnace first cost is 40% less.
Space allowed for 3 electric furnaces is ⅓rd less.
Electrics get into production faster.
More precise temperature control and no contamination from fuels.
Faster heats, because charging time is cut in half.
Greater flexibility; need run only to suit demands.
Operating costs are consistently lower; ingots average 5% less.
Catalog 9-B describes Lectromelt Furnaces.
Lectromelt Furnace Division, McGraw-Edison Company,
323 32nd Street, Pittsburgh 30, Pennsylvania.

Lectromelt

*Reg. T. M.
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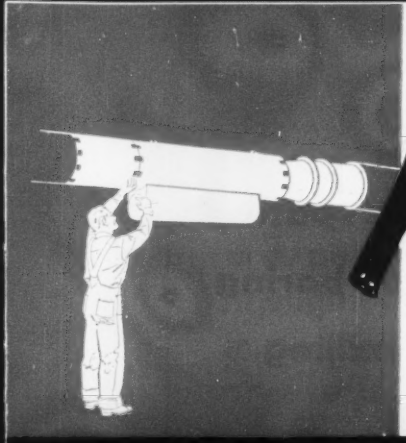
ITALY: Forni Stein, Genova . . . JAPAN: Daido Steel Co., Ltd., Nagoya . . . ENGLAND: Electric Furnace Co., Ltd., Weybridge . . . GERMANY: Demag-Elektrometallurgie, GmbH, Duisburg . . . SPAIN: General Electrica Espanola, Bilbao . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Stein & Roubaix, Bressoux-Liege.



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THE COMPACT, HIGH EFFICIENCY

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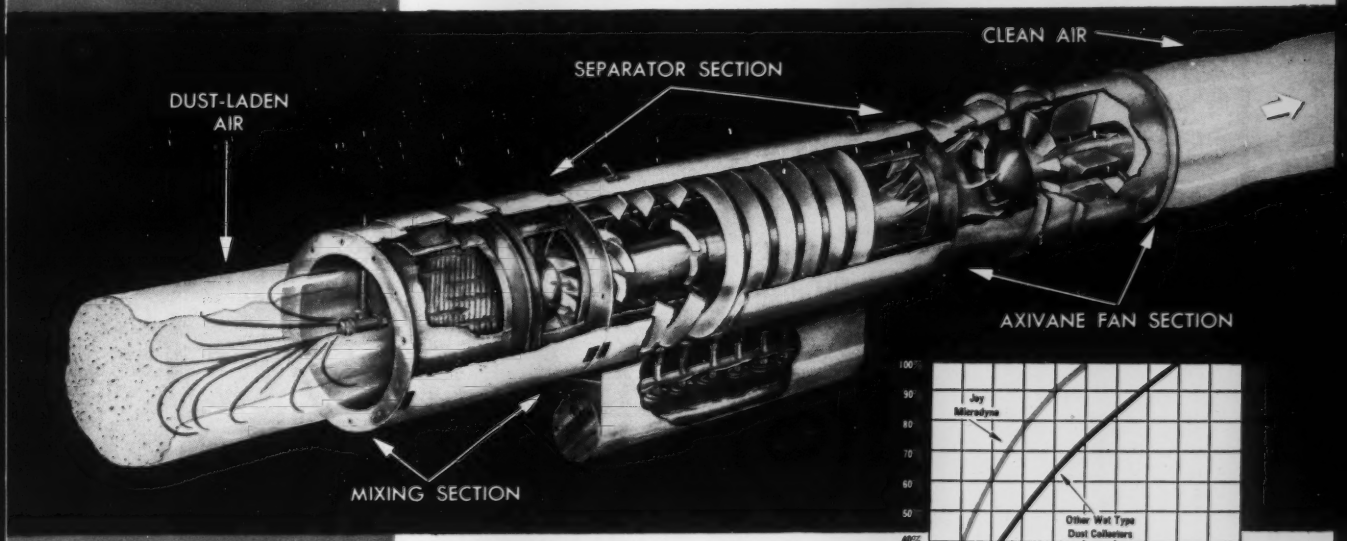
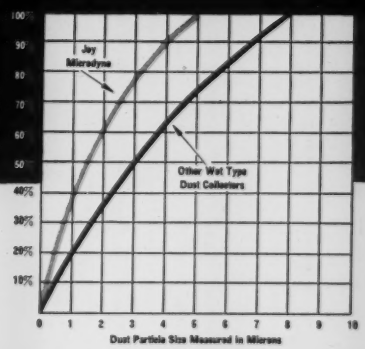




1/10 to 1/20

THE SIZE OF ANY OTHER DUST COLLECTOR

Here's a new, wet-type dust collector with an efficiency rating of over 99% down to 5 microns, yet so small and compact it fits where no other collector could. Your own maintenance crew can bolt it easily into existing ductwork, often right where dust originates. Air-borne dust particles, drawn into the mixer section by a Joy Axivane fan at the rear of the collector, are entrained by water after impact on an impingement element.

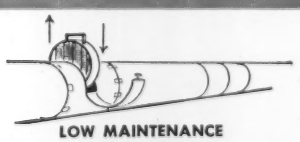
Dust encased in water droplets passing to the second section are directed by centrifugal force to the wall of the cylinder, thence to a sump below, where the slurry can be pumped or drained away. Low power and water requirements result in unusually low operating cost. ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** *In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

CAN BE INSTALLED WHERE NO OTHER DUST COLLECTOR COULD FIT

Fits into existing ductwork, often right at point of use.

CLEANS 2500 to 64000 CUBIC FEET EACH MINUTE

There is a Joy Microdyne model designed to meet the special conditions of the application.



LOW MAINTENANCE AND POWER COST

Self-cleaning impingement unit is easily removed. Power requirements are unusually low.

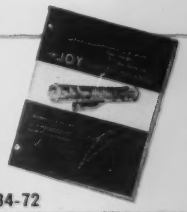
LOWEST COST PER CFM FOR THESE TYPICAL APPLICATIONS

- Metal scale in steel plants and foundries
- Air-borne sand in foundries
- Cleaning air contaminated in mining operations
- Coal dust at screening and drop-off points
- Wherever crushing or grinding operations occur
- Recovery in Uranium mining
- Explosive dust in grain elevators or flour mills
- Dust from granite quarrying and finishing
- Removal of sulfuric acid mist
- Removal of abrasive dusts like taconite

Write for FREE Bulletin JB-616 or FREE Dust Test

Get this descriptive bulletin or let a Joy Engineer take dust samples at your job site for plant analysis.

ADDRESS DEPT. 184-72



JOY MANUFACTURING COMPANY

EQUIPMENT FOR INDUSTRIAL PLANTS . . . FOR ALL INDUSTRY

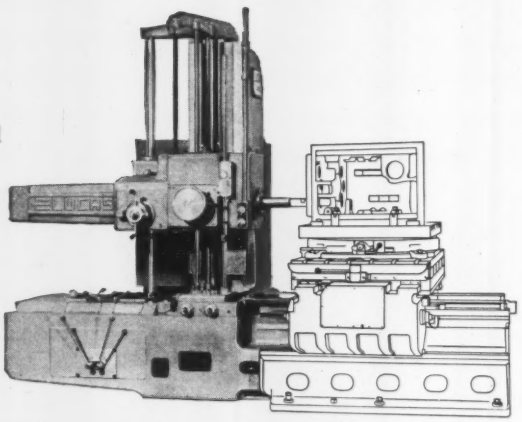
WSW 1-6710-184

Select a Lucas

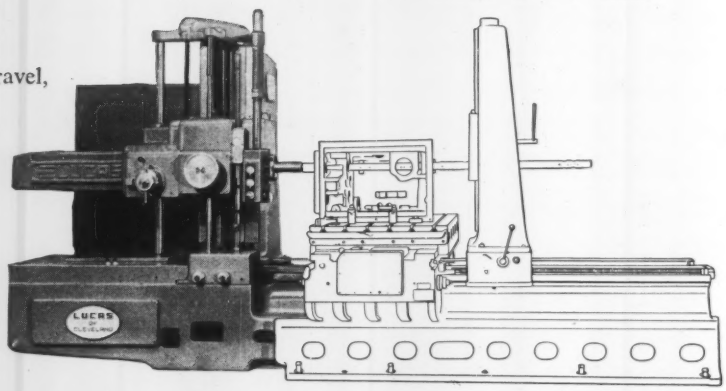
for accurate spacing
for precision boring
for heavy milling

Your choice of controls—

STANDARD LEVER CONTROLS
available for use with both short bed or backrest models.



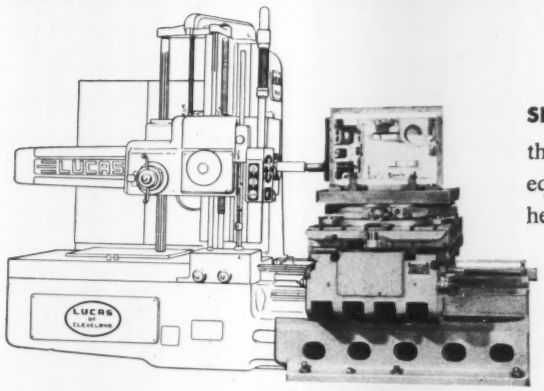
FULL PENDANT CONTROL
of feeds, speeds and directional travel, optional on any Lucas.



Whether you do line or stub boring, whether you prefer lever or automatic pendant control, you get the basic advantages of automatic power positioning and 4-way beds. Whichever model you select you get the benefit of continuing design improvement, backed by 57 years of specialization and leadership in this field *plus* the full resources of The New Britain Machine Company.

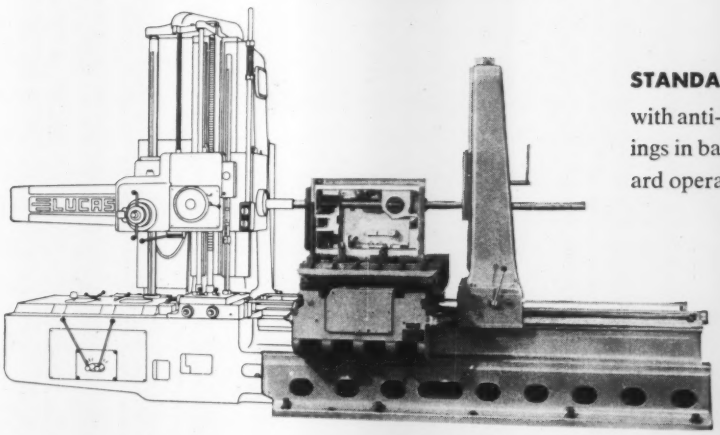
in production
in the tool room
in experimental work
in engineering research
in maintenance applications
or several, in combination

your choice of beds



SHORT BED MODELS

the most compact and economical equipment for precision stub boring, heavy milling and horizontal drilling.



STANDARD BED WITH BACKREST

with anti-friction bearing mounted bushings in backrest block, handles all standard operations including line boring.

LUCAS OF CLEVELAND

LUCAS MACHINE DIVISION
The New Britain Machine Company
Cleveland, Ohio

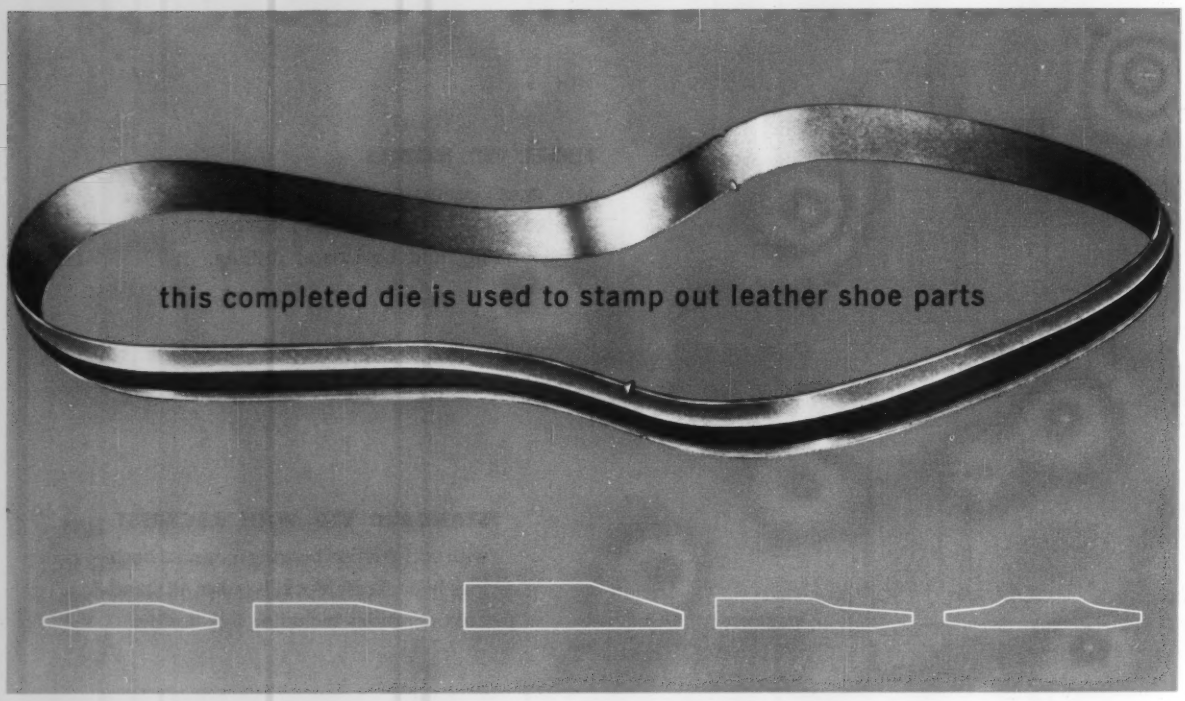
OTHER NEW BRITAIN MACHINE TOOLS DIVISIONS

New Britain-Gridley Machine Division
New Britain, Connecticut

Hoern & Dilts Division
Saginaw, Michigan

CHOOSE CRUCIBLE COLD ROLLED CLICKER DIE STEELS

FOR CLOSE TOLERANCES—FINE FINISH



Crucible clicker die shapes are cold rolled for better finish, closer size tolerances and minimum decarburization. And their thinner edges require less grinding and filing to complete the die.

What's more, *closely controlled* electric melting gives Crucible alloy clicker die steels maximum toughness, combined with just the right hardness after heat treatment. Edges *stay* sharp, yet are easy to file.

Does one of the basic shapes shown fit your exact needs? Or do you require a similar shape in carbon or alloy steel for this or other applications? In either case, you'll find reliable delivery, and helpful service, when you order through your nearby Crucible Branch. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

For shapes and details send for Clicker Die Information Sheets.

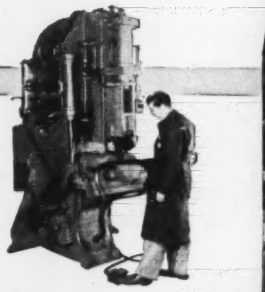
CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

4 COST-CUTTING SOLUTIONS

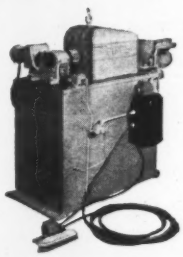
FOR FABRICATORS OF TUBING, PIPE, MOLDINGS AND EXTRUDED SHAPES

PINES SIZE 4 BENDER — Now cold forms ultra-thin 4" x .020" stainless steel tubes for aircraft to 8" c/l radius. Ability to form these sharp, small radius bends without wrinkles saved $14,000 per plane for an aircraft manufacturer.



PINES 20-TON BENDING PRESS — Speeds production of automotive tail pipes, completes some jobs 50% faster by eliminating work handling. Up to 10 bends produced in a single progressive operation, most jobs completed in one handling.

PINES SEMI-AUTOMATIC BENDER — Capacity up to 300 bends per hour, for applications where output does not require speed of fully automatic machines. Hydraulic power assures accurate, highly uniform results. Economically tooled, easy for women to operate, requires up to 60% less floor space.



PINES END-FINISHING MACHINE — 3" capacity, floor-mounted unit with air clamping. Speeds deburring, facing, pointing, or light hollow mill turning. Available with manual or air spindle advance. Other units also provided for smaller and larger work.

● Since 1941, when Pines Automatic Hydraulic Bending Machines were first introduced, more and more plants fabricating tubing, pipe, rods, moldings, rolled and extruded shapes, have found it profitable to standardize on Pines Machines. Dependable accuracy, combined with fast, more efficient operation are two of the major reasons why hundreds of commercial and industrial plants have turned to Pines to find cost-cutting solutions to bending and end-finishing problems. A study of the four examples shown here may suggest how you may profitably take advantage of the latest developments in fabricating the "Pines-way".

WRITE FOR *Free* DATA SHEETS

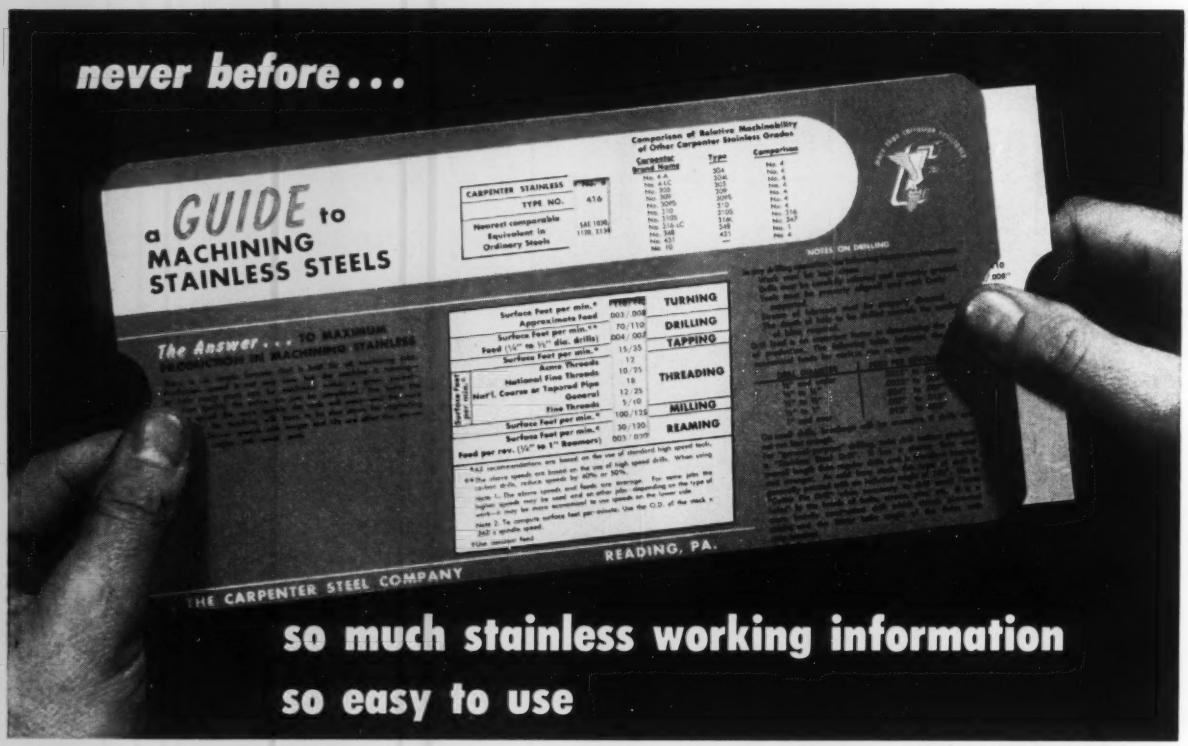
For additional cost-cutting ideas, write today for free copies of "Pines News"—illustrates latest bending and end-finishing techniques applied to actual jobs. And call on Pines engineers for assistance on any job.

PINES ENGINEERING CO., INC.

Specialists in Tube Fabricating Machinery

662 WALNUT • AURORA, ILLINOIS

PRODUCTION BENDING • DEBURRING • CHAMFERING MACHINERY



Carpenter's new stainless slide chart is a guide

Here's the newest example—*just off the press*—of how Carpenter printed information is designed to help you and your men when working with stainless.

Now, right at your fingertips, you can have practical data to help you make the most of every pound of stainless you use . . . quickly answer many time-consuming daily questions.

For the first time, with slide chart ease, accuracy and convenience, you can quickly uncover working information about machining speeds and feeds, for *turning, drilling, tapping, threading, milling and reaming.* One entire side is devoted to such helpful facts as these—all taken from Carpenter's widely used "Notebook on Machining Stainless Steels".

The reverse side is equally valuable. Completely up-to-date, it gives the relative workability for many stainless grades . . . helps you quickly pinpoint the proper stainless for *drawing, forging, heading, swaging, welding, buffing, etc.*

For your personal copy, simply drop us a line on your company letterhead. If you'd like some extra copies of this NEW Carpenter Stainless Slide Chart for others in your plant, just tell us.

These formulas are just a sample of the help you can expect from Carpenter's NEW Stainless Slide Chart.

No. 1 — for obtaining tap drill size:

$$\text{Outside Diameter} - \frac{.0130 \times \%\ \text{Full Thread}}{\text{Number of threads per inch}} = \text{Drill Size}$$

Example - for ¼" × 20 thread:

$$.250 - \frac{.0130'' \times 75}{20} = .2013 \text{ or number 7 drill}$$

No. 2 — for obtaining percentage of thread a given drill will produce:

$$\frac{(\text{Outside dia.} - \text{drill size}) \times \text{number threads per inch}}{.0130} = \%\ \text{of full thread}$$

Example - for ¼" × 20 thread:

$$\frac{(.250 - .201) \times 20}{.0130} = 75.4\%\ \text{thread}$$

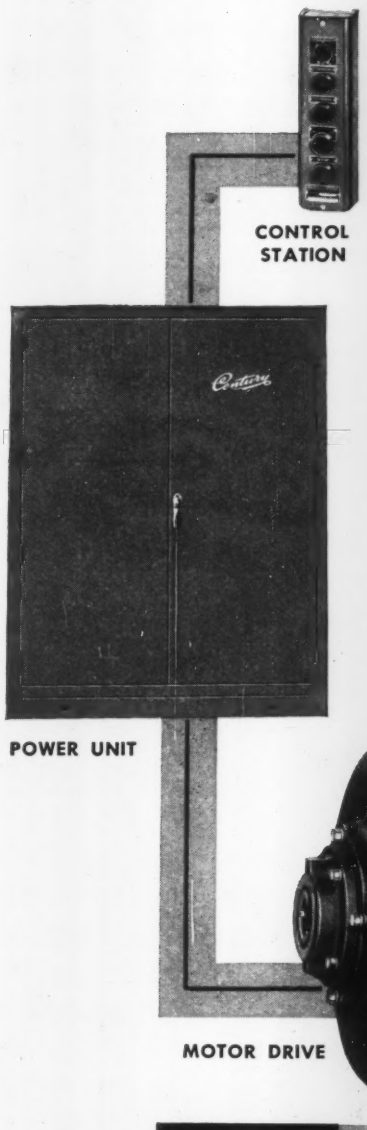
Carpenter STEEL

Free-Machining Stainless Steels

The Carpenter Steel Company, 139 W. Bern St., Reading, Pa.
Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Your customers may need this drive...

TO AUTOMATE YOUR MOTOR DRIVEN PRODUCTS...
GIVE THEM PRECISE, VARIABLE SPEED CONTROL...



Century Performance-Rated©

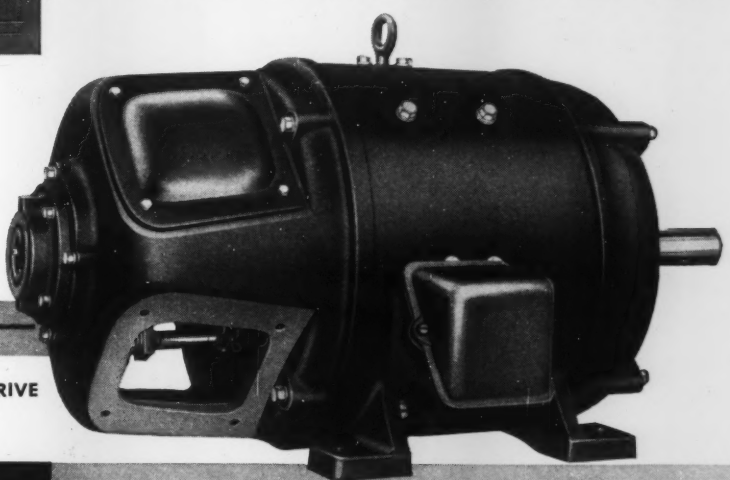
SELECTIVE SPEED DRIVE

How many of your customers could use the *full* potential of your product when given automatic operation by a Century Selective Speed Drive? Possibly more than you think.

Here's why. Predetermined, *automatic* manufacturing operations are faster, more accurate than manually controlled operations. A Century Selective Speed Drive on your product will respond to changes in operations—such as varying temperature, pressure, size, viscosity—and *automatically* adjust motor speed to fit the job.

Operating from AC, these drives offer a broad range of DC stepless speed control. They can regulate speed for individual drives or for precision interlocked multi-motor drives . . . can be used for jogging, normal or fast starts and stops, forward or reversing . . . and respond to a wide variety of remote control devices.

Century has more than 50 years' experience in engineering DC motors. For information on any motor application, call or write your nearby Century District Sales Office or Authorized Distributor.



76

Performance-Rated © MOTORS
1/20 to 400 H.P.

CENTURY ELECTRIC COMPANY

1806 Pine Street • St. Louis 3, Missouri • *Offices and Stock Points in Principal Cities*

HELIARC Welding
finds satellite jobs are right in its orbit

Welding together sections for an earth satellite, under the most exacting specifications, may not be your particular problem. But if welding light-gage, hard-to-weld metals is slowing up your production—LINDE's HELIARC Inert Gas Shielded Arc Welding, using LINDE Argon as a shielding gas, may be just what you've been looking for.

HELIARC Welding is LINDE's method for high-speed fusion of commercial metals, automatically, or manually in all positions. LINDE Argon, guaranteed 99.99% pure, protects the weld. It is readily available, in cylinders or in bulk, from convenient sources all over the nation.

Get more information about HELIARC Welding and LINDE's other modern welding methods. For a free copy of the booklet, "Modern Methods of Joining Metals," address Dept. ST-82. LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. *In Canada:* Linde Company, Division of Union Carbide Canada Limited.

FOR THE BEST IN ELECTRIC WELDING—LOOK TO LINDE!

Shells of the Earth Satellite, Project Vanguard, are made of .050-in. magnesium alloy sheet, containing small amounts of aluminum and zinc. Internal framework and pressure chamber cover ring (above) are manually welded by HELIARC Welding, a LINDE development utilizing an argon-shielded tungsten arc. Brooks & Perkins, Inc., are the fabricators.

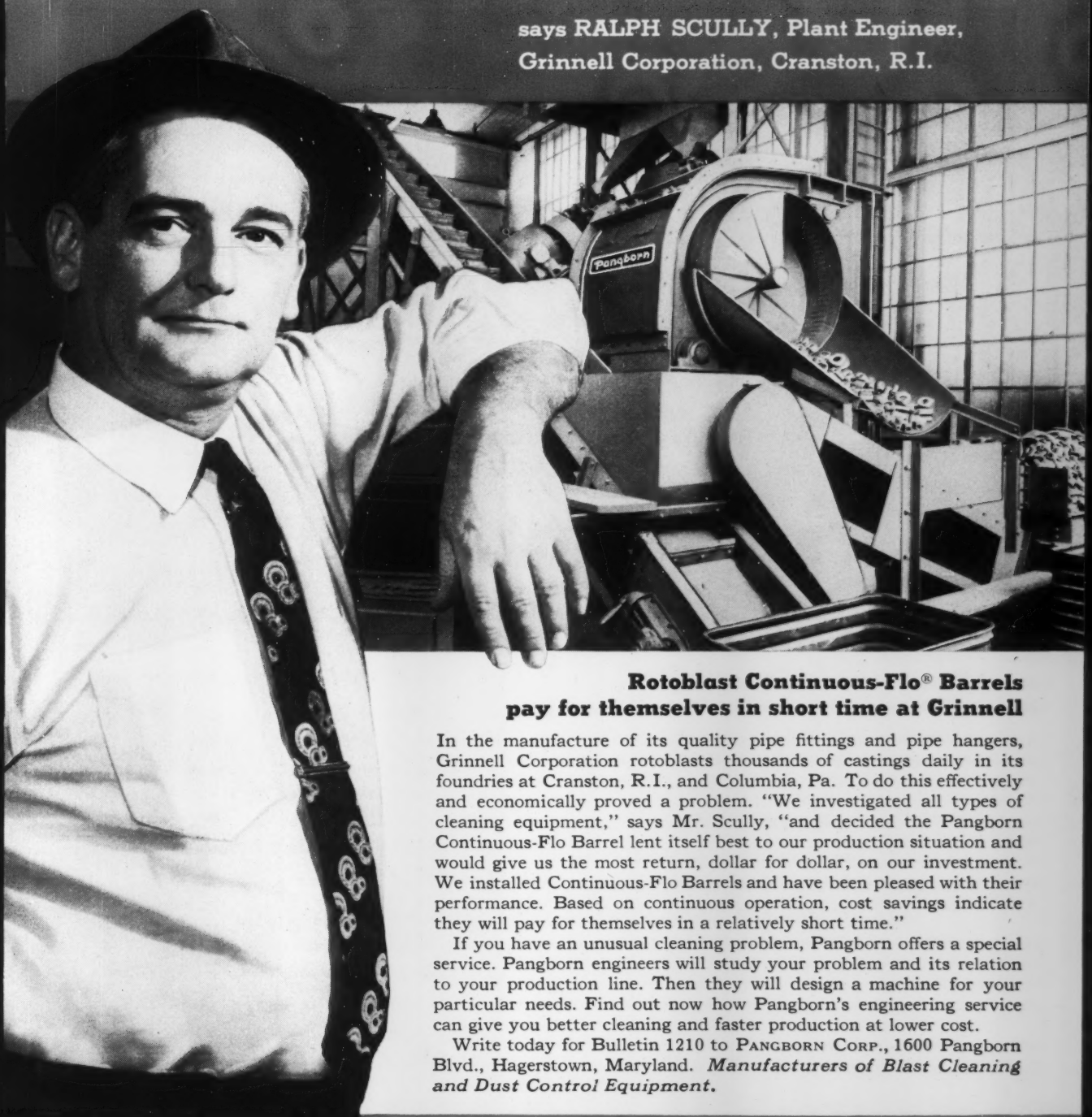
Linde TRADE-MARK

UNION CARBIDE

The terms "Linde," "Heliarc" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

"...the most return, dollar for dollar, on our investment"

says RALPH SCULLY, Plant Engineer,
Grinnell Corporation, Cranston, R.I.



Rotoblast Continuous-Flo® Barrels pay for themselves in short time at Grinnell

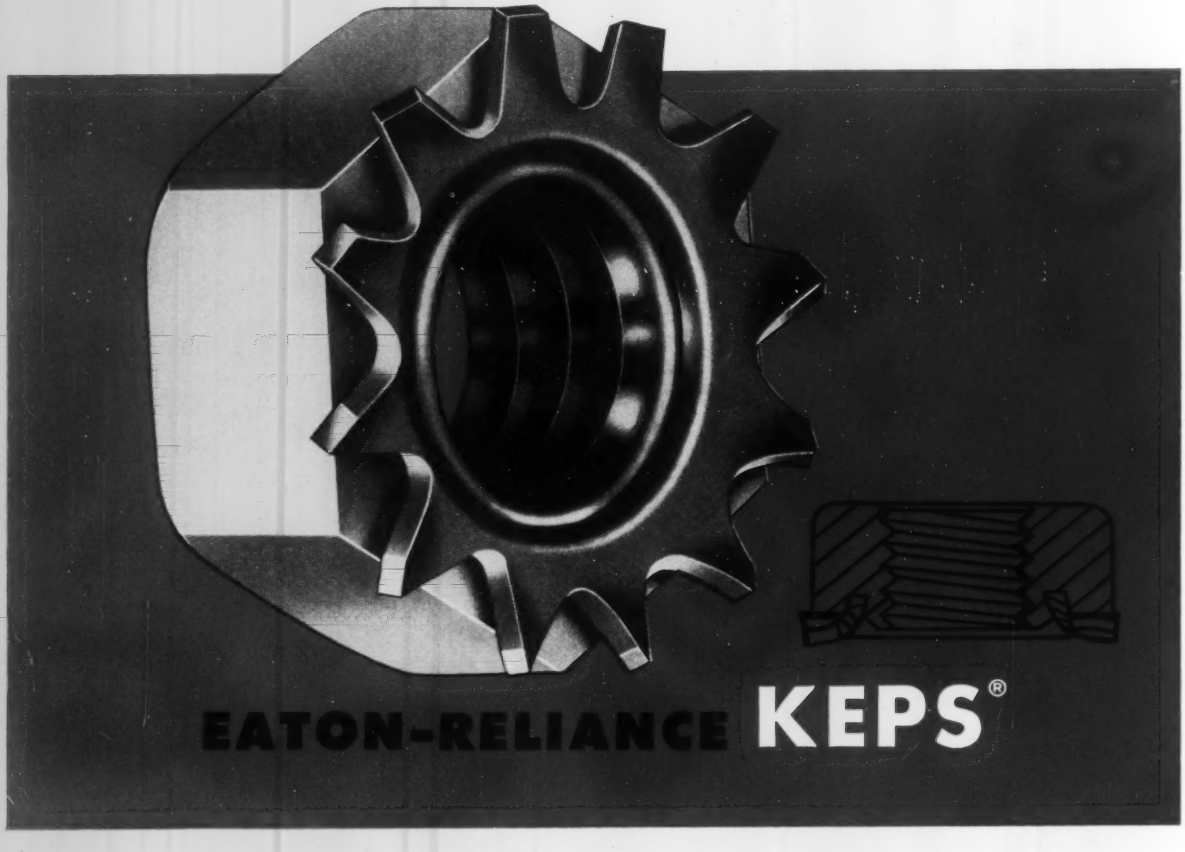
In the manufacture of its quality pipe fittings and pipe hangers, Grinnell Corporation rotoblasts thousands of castings daily in its foundries at Cranston, R.I., and Columbia, Pa. To do this effectively and economically proved a problem. "We investigated all types of cleaning equipment," says Mr. Scully, "and decided the Pangborn Continuous-Flo Barrel lent itself best to our production situation and would give us the most return, dollar for dollar, on our investment. We installed Continuous-Flo Barrels and have been pleased with their performance. Based on continuous operation, cost savings indicate they will pay for themselves in a relatively short time."

If you have an unusual cleaning problem, Pangborn offers a special service. Pangborn engineers will study your problem and its relation to your production line. Then they will design a machine for your particular needs. Find out now how Pangborn's engineering service can give you better cleaning and faster production at lower cost.

Write today for Bulletin 1210 to PANGBORN CORP., 1600 Pangborn Blvd., Hagerstown, Maryland. *Manufacturers of Blast Cleaning and Dust Control Equipment.*

Pangborn ROTOBLASTS cheaper

FAST FASTENERS FOR FASTER PRODUCTION



With the race on for better products at lower costs, production men everywhere are turning to time and labor saving devices of all types. Eaton-Reliance Keps will fasten assemblies in a minimum of time with a maximum of efficiency.

The tooth type washer preassembled, freely rotating on the nut, permits a quicker assembling of the part, time savings, increased production, an elimination of lost parts, and exactly balanced inventories. They are made to "funnel" onto the bolt providing easy starts.

Keps can be hopper fed thus providing the additional advantage of automatic assembly. Investigate this new efficient fastening device and profit by these savings as hundreds of other quality product manufacturers are now doing.

Additional information supplied upon request or a Fastening Engineer will call without obligation.

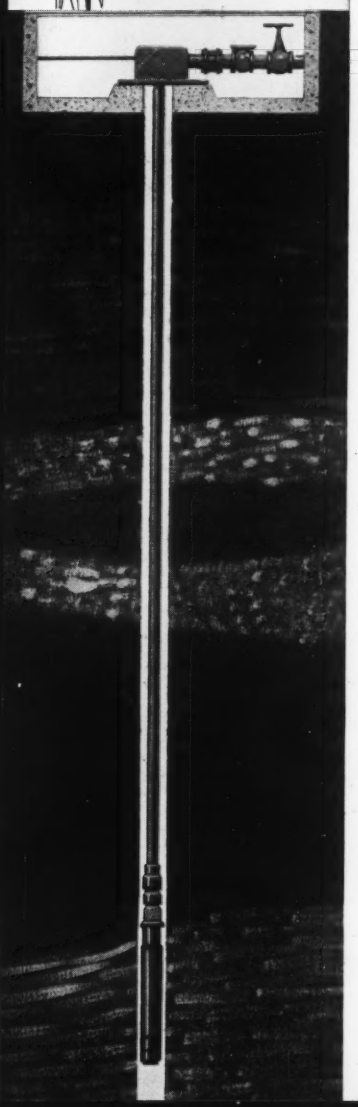
EATON

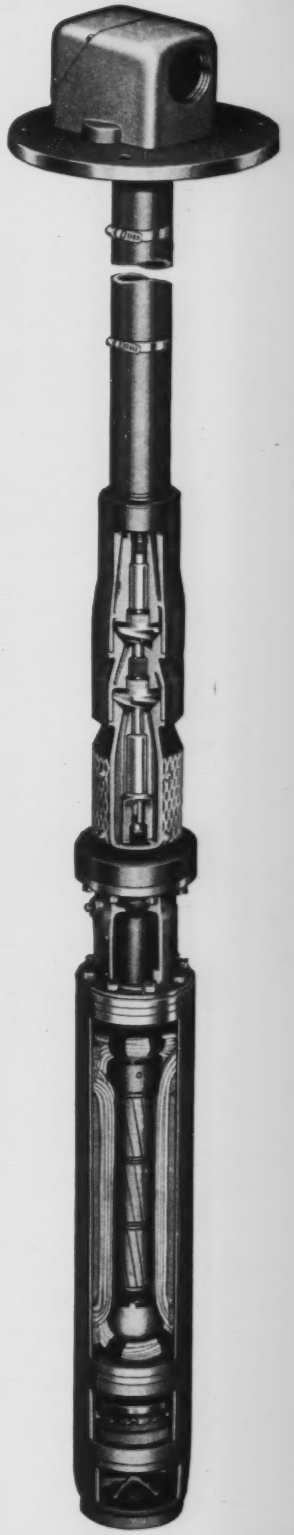
RELIANCE DIVISION
MANUFACTURING COMPANY
514 CHARLES AVENUE • MASSILLON, OHIO

SALES OFFICES: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Now you can bury your pumping problems





FAIRBANKS-MORSE
Water-Lubricated Submersible Pump

Now you can have all the advantages of a submersible pump, plus time- and performance-tested Fairbanks-Morse features.

Fairbanks-Morse submersible pumps permit well location anywhere that a well can be drilled. No unsightly installations, no costly pump housing. Nothing—absolutely nothing—need show above ground. These pumps submerged in the well below water level are practically soundless and require no line shafts, packing boxes or lubrication devices. Hence, wearing parts needing maintenance are reduced to a minimum. A single moving assembly does all the work.

Installation is faster and more economical. The Fairbanks-Morse motor, with lifetime Copperspun rotor cooled by water and lubricated by water, gives full motor output. The well-known Fairbanks-Morse or Pomona pump bowls are combined with these wet stator motors to produce unbeatable pumping units covering a wide range of requirements as to volume, pressure, and setting depth.

For industry or community service you can place your water service trust in the F-M submersible. Contact your Fairbanks-Morse Sales Engineer and ask him for Bulletin 6910 on this time-proved submersible pump, or write today to Fairbanks, Morse & Co., Dept. S-8-12, 600 S. Michigan Avenue, Chicago 5, Illinois.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY
RAIL CARS • HOME WATER SERVICE EQUIPMENT • MAGNETOS

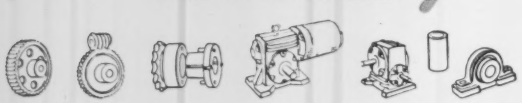
Get your BEARINGS from this big line...

and keep headed for lower costs

You'll find the bearing products you need among the thousands of types and sizes listed in the BOSTON GEAR Catalog No. 56. There is no finer quality, and you can get them faster . . . FROM STOCK — at your nearby BOSTON GEAR Distributor. Call him today, for prompt service. Boston Gear Works, 73 Hayward St., Quincy 71, Mass.

7124 POWER TRANSMISSION PRODUCTS FROM STOCK

CALL YOUR BOSTON Gear® DISTRIBUTOR

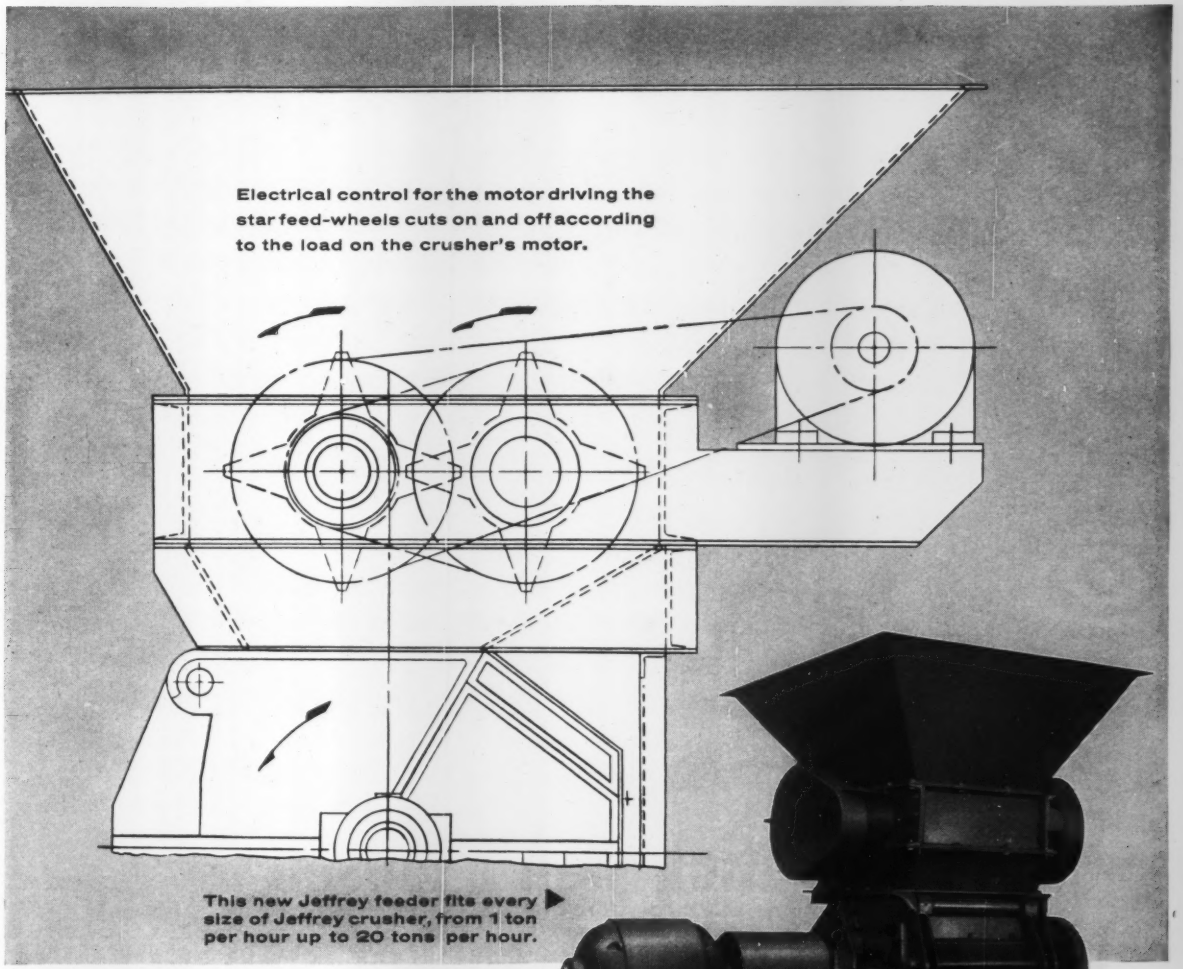


Stock Gears • Sprockets and Chain • Speed Reducers • Bearings • Couplings

Save over 45% with a BOSTON GEAR BEARING BANK

In any emergency, 24 hours a day, the bearing you need is available from your "BANK". No costly delays. Bearings cost 46% less than if bought separately.

"BANK" assortments available in BEAR-N-BRONZ or BOST-BRONZ, from your Distributor.


Electrical control for the motor driving the star feed-wheels cuts on and off according to the load on the crusher's motor.
This new Jeffrey feeder fits every size of Jeffrey crusher, from 1 ton per hour up to 20 tons per hour.

NEW JEFFREY

Metal-Turnings Feeder

works crusher at full load and prevents stalling

● Metal turnings are profitable when they're reduced to a shoveling size. Jeffrey crushers perform that task well, simplifying handling, cutting costs for hauling, and permitting reclamation of valuable oils.

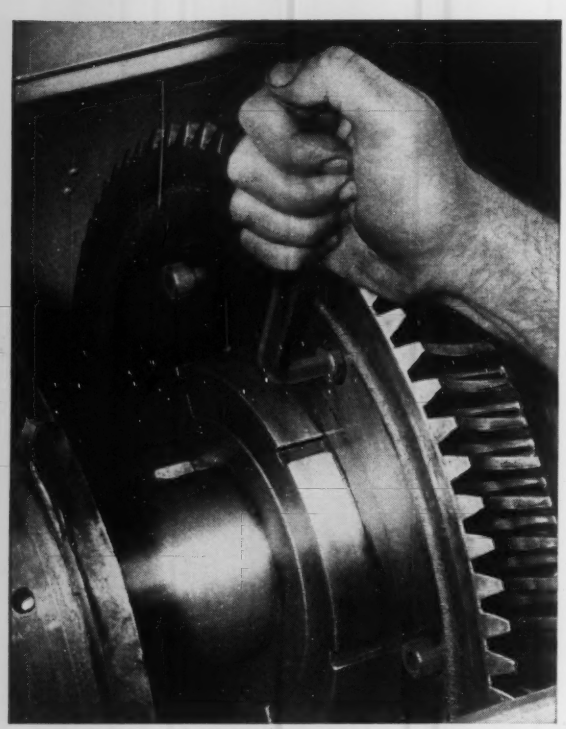
But feeding a crusher has always been a problem, with workers tugging and shoveling, while taking care not to stall the motor by crowding the crusher. Jeffrey's new metal-turnings feeding device cuts labor to a minimum, while keeping the crusher working at maximum capacity.

The hopper takes 2 to 3 cubic yards of turnings, so it can be filled directly from tote boxes or magnets. The star wheels force turnings down into the crusher until its drive motor "complains" to the electrical controls. The feed shuts down temporarily, but starts again as the load slacks off.

For complete data, get in touch with The Jeffrey Manufacturing Company, 889 North Fourth Street, Columbus 16, Ohio.

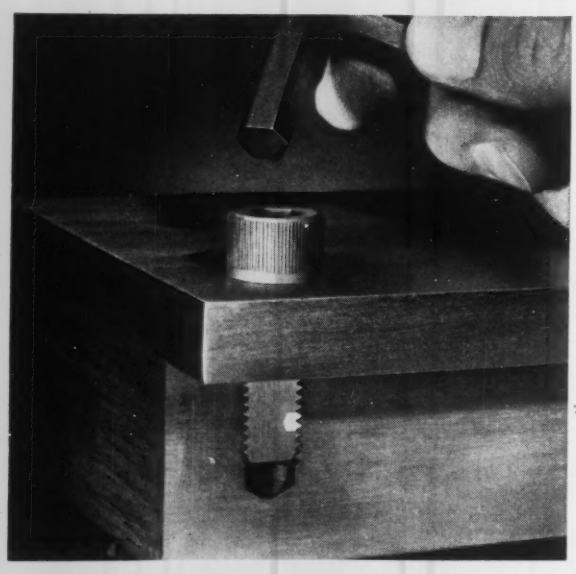
CONVEYING • PROCESSING • MINING EQUIPMENT . . . TRANSMISSION MACHINERY . . . CONTRACT MANUFACTURING

JEFFREY



The ordinary fasteners securing the worm wheel to the drum shaft in this automatic screw machine loosened, causing $120 worth of damage to parts. Labor for the repair job cost $100. The ordinary fasteners were replaced with self-locking UNBRAKOS, and there has been no trouble since.

Vibration won't loosen self-locking UNBRAKO socket cap screws



HOW IT LOCKS. The tough, resilient Nylok locking pellet keys itself into the mating threads. It forces threads together and locks the screw securely—whether or not the screw is seated.

UNBRAKO socket screws with the Nylok* self-locking device eliminate fastener problems caused by vibration.

Take the drive system in the automatic screw machine illustrated above, for example. The screws originally used to secure the worm wheel to the drum shaft loosened, causing considerable damage, besides loss of production time. These have now been replaced with self-locking UNBRAKO socket head cap screws and the trouble has been eliminated.

An UNBRAKO socket screw with the Nylok self-locking device is a single unit. Just screw it into any tapped hole. Seated or not, it locks positively wherever wrenching stops. Constant vibration or endless running of a machine won't affect these self-locking UNBRAKOS. The screws will not work loose!

Write today for your copy of Form 2193, which gives catalog and technical data on the complete line of UNBRAKO socket screws with the Nylok self-locking device. Or see your local industrial distributor. Unbrako Socket Screw Division, STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

UNBRAKO® SOCKET SCREW DIVISION

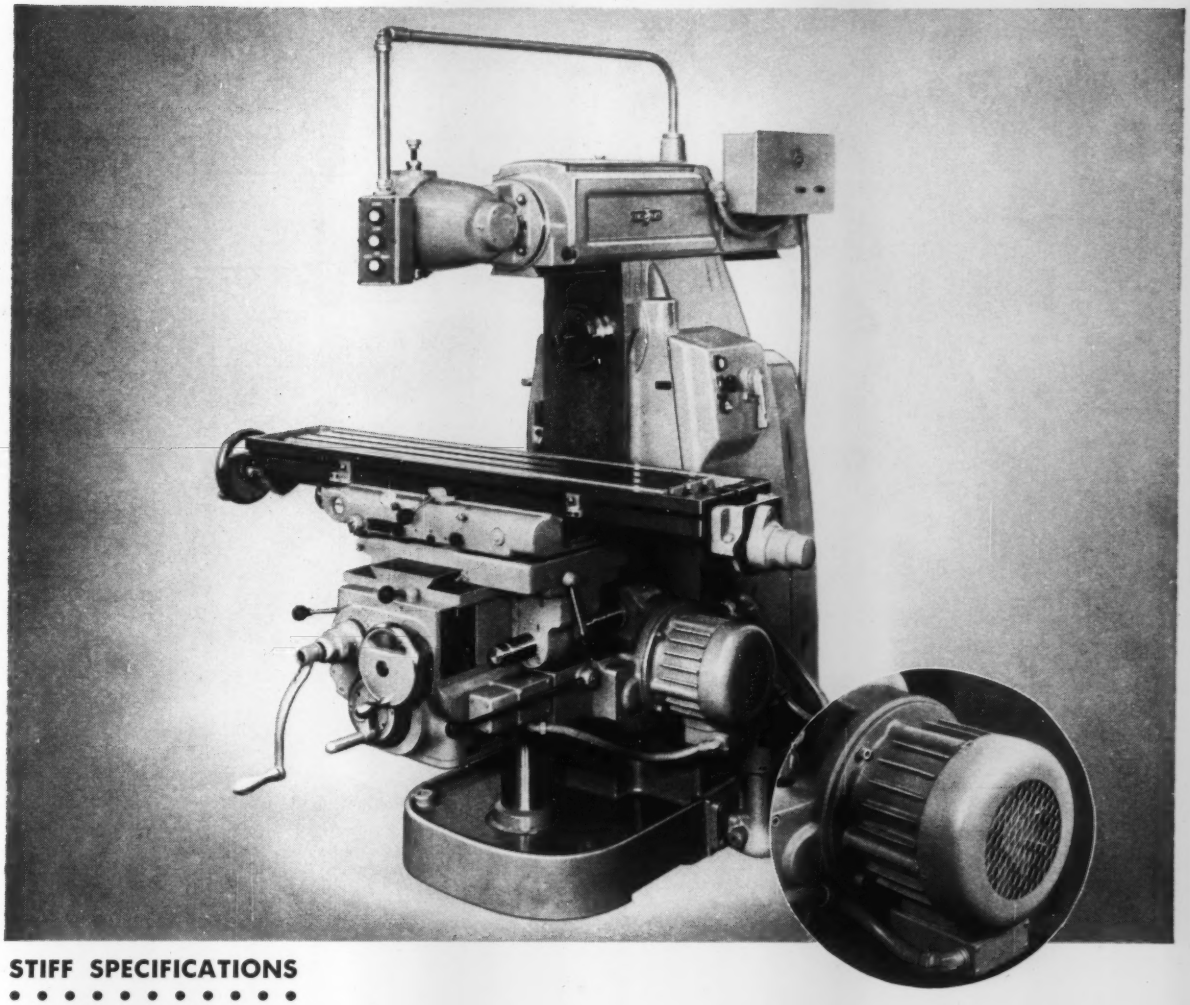
STANDARD PRESSED STEEL CO.

SPS

JENKINTOWN PENNSYLVANIA

STEEL

*T.M. Reg. U.S. Pat. Off., The Nylok Corporation



STIFF SPECIFICATIONS

Yet a DIEHL motor met all requirements

The requirements of one of the largest milling machine manufacturers called for a close-coupled, special duty motor to raise and lower the knee and develop sufficient torque for heavy table loads in rapid traverse without stalling. Cool operation was imperative to avoid distortion of the machine table due to heat transfer. The motor was to be mounted directly on the gear case, therefore complete protection against oil leakage into the motor was essential. Motor size, compactness and appearance were important factors. DIEHL developed the special totally enclosed motor illustrated, which met all desired requirements. Cool operation was assured by the fan-cooled design of the motor, effectively preventing heat transfer. The flat-type construction saved considerable space and overhang, conforming well with machine contours. Positive and dependable machine operation was the end result.

This is another example of DIEHL accomplishment based on almost three-quarters of a century of experience in the design and manufacture of motors for industry. Utilize this experience in the solution of your motor problems. We'll work closely with you to provide the right motor — at the right time — at the right price.

DIEHL MANUFACTURING COMPANY
Electrical Division of
THE SINGER MANUFACTURING COMPANY
Finderne Plant, SOMERVILLE, N. J.

Diehl

☐ Please send me Consolidated Motor Catalog and Price List No. S-8 —3540

☐ Please have a DIEHL representative call

NAME _____

COMPANY _____

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Variety
Economy
Quality

Johnson Standard Stock Bearings

You save time and money when you use Johnson standard stock bearings, but not at the cost of lowering tolerances or limiting freedom of design. Over 900 sizes of these bearings in over 200 combinations of inside and outside diameters are available in a number of lengths machined to exacting tolerances.

Your savings come from the economies of volume production and the elimination of tool and die charges. Time is saved because shipment is made from distributor stocks in your vicinity.

If you are not taking advantage of the economy and flexibility of Johnson standard stock bearings, write for full information including the name of your nearest Johnson distributor.

Johnson Bronze

550 South Mill Street • New Castle, Pa.

JOHNSON Bearings

GRAPHITED
over 175 sizes

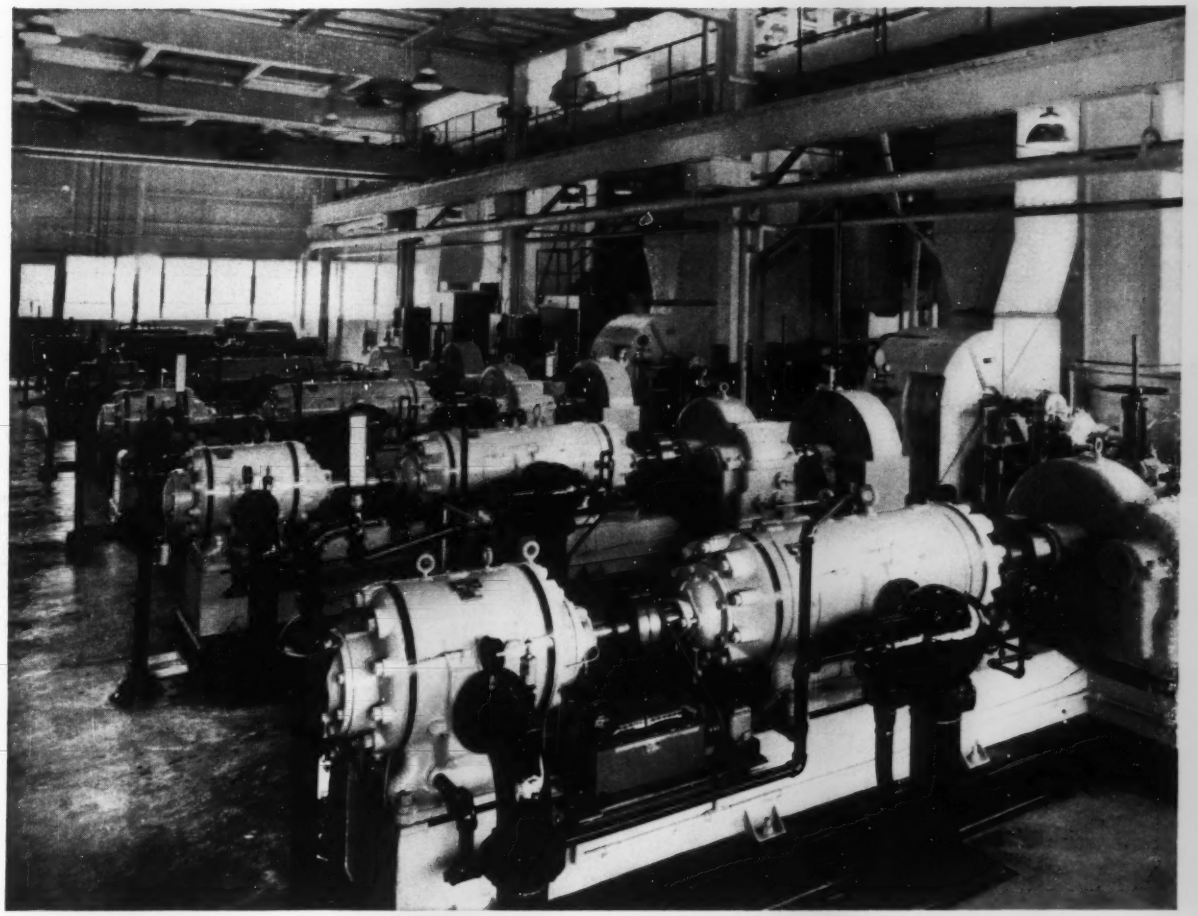
GENERAL PURPOSE
over 900 sizes

UNIVERSAL BRONZE BARS
over 400 sizes

LEDALOYL
over 500 sizes

ELECTRIC MOTOR
over 350 sizes

JB71-IR



4 YEARS - - 25,000 HOURS OPERATING PERFORMANCE!

This is just one of many production records set by Fuller Rotary Compressors—in this case by each of six machines installed in a leading aircraft plant. The only maintenance or replacement necessary over this period was installation of high and low pressure blades. Bearings held up 100%.

Fuller rotary compressors shown are four C-300-300H, steam turbine drive, capacity each 1248 to 1805 c.f.m., with speed ranges of 450 to 650 r.p.m., 125-lb. gauge pressure, and two electric motor drive, capacity each 1663 c.f.m., at 600 r.p.m., 110 lb. gauge pressure.

Your plant, too, can take advantage of the many cost-saving advantages of Fuller rotary compressors; such as smooth airflow, lack of vibration minimum of moving parts, adaptability to any production setup, and the advantage of "one man" operation.

Write today to Fuller Company and get complete data on how Fuller rotary compressors can give you more air power at less cost.

Fuller

FULLER COMPANY GENERAL AMERICAN TRADE MARK

FULLER COMPANY C-312 4659

160 Bridge St., Catasauqua, Pa.

SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION

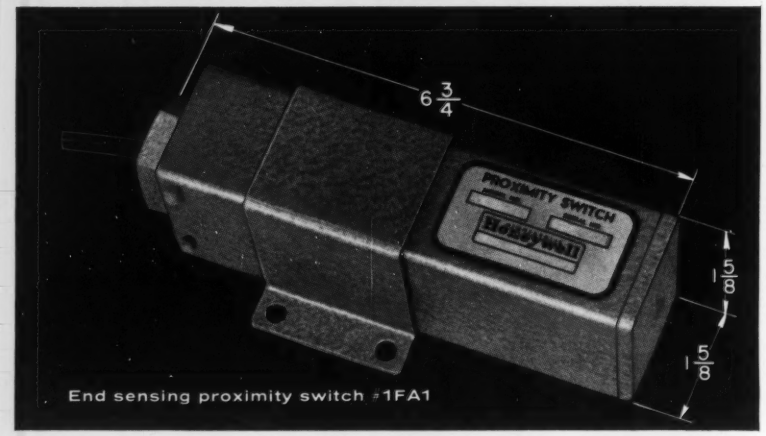
Birmingham · Chicago · Kansas City · Los Angeles · San Francisco · Seattle

PIONEERS OF HIGH-EFFICIENCY VANE TYPE ROTARY COMPRESSORS SINCE 1930

MICRO SWITCH . . . FIRST IN PRECISION SWITCHING

NEW!

The Honeywell Proximity Switch



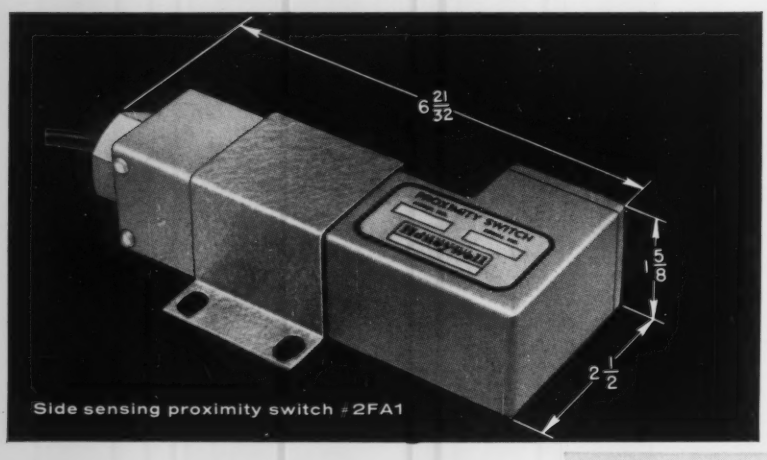
End sensing proximity switch #1FA1

Ideal limit switch on automatic machine tools—for use in materials handling control—for programming operation of transfer machines in automation equipment.

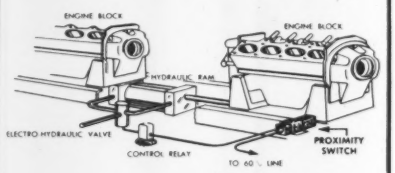
Consider these important features of this sensational magnetic switching device—

- **LONG LIFE**—No moving parts . . . no electrical contacts . . . no vacuum tubes.
- **HIGH SPEED OPERATION**—Will operate as many as 600 times a minute.
- **EXTREMELY SENSITIVE**—Can be operated by ferromagnetic surface as small as ¼ in. square and 1 in. long.
- **RESISTS ENVIRONMENT**—Relatively insensitive to ferrous chips . . . potted to permit operation in high humidity, corrosive atmosphere, or in presence of cutting oils . . . protected by heavy steel housing.

(*Request Data Sheet Nos. 119 and 130*)



Side sensing proximity switch #2FA1



Proximity switch used to activate an engine block transfer line

SPECIFICATIONS

EXCITATION
100-125 v, 60 cps, 2 watts (nominal).

OUTPUT
(a) switch "on"—12 vdc minimum into 250 ohm load; (b) switch "off"—4 vdc maximum into 250 ohm load.

SENSITIVITY
When a block of ferromagnetic material is moved parallel to and within ⅛ in. of its pole face, the Proximity Switch will operate the control relay.

REPEATABILITY
When a block of ferromagnetic material is moved parallel to and within ⅛ in. of its pole face, the Proximity Switch will repeat its pick-up and drop-out point within 3/32 in.

DIFFERENTIAL
When a block of ferromagnetic material is moved parallel to and within ⅛ in. of its pole face, the Proximity Switch will have a differential distance between pickup and drop-out of less than 7/32 in.

Any MICRO SWITCH field engineer will be glad to work with you regarding the wide applications for this new Proximity Switch.

MICRO SWITCH
A DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR COMPANY
In Canada, Leaside, Toronto 17, Ontario • FREEPORT, ILLINOIS

AN EXAMPLE OF ALCHEMY

Transmutation of machine chips (background to foreground) from base steel to pure profit

The chips in the foreground aren't really gold – but they are the next best thing if you do extensive machining on circular forgings. They're Hi-Qua-Led Steel®. They are also the same grade steel as the chips in the background – 4140. You can see the great difference, but let us tell you something about it, too.

An initial production run in a customer's plant – using a Fellows gear shaper – produced both sets of chips. The regular 4140 steel forging had a Bhn of 285; the 41L40 Hi-Qua-Led Steel forging in the same grade had a Bhn of 285 to 293. Here are the results:

	4140 Steel	41L40 Hi-Qua-Led Steel
Roughing cut	50-60 sfm 0.0145 feed 0.530 depth of cut	80-85 sfm 0.0176 feed 0.533-0.538 depth of cut
Finish cut	50-60 sfm 0.0145 feed 0.033 depth of cut	100 sfm 0.0176 feed 0.025-0.030 depth of cut
State of finish	regular	super-finished
Total machining time	3½ hr average per gear (excluding down time for tool breakage)	2 hr average per gear (no tool breakage)

Machining time saved: 1½ hours or 43 per cent per gear. The savings shown in this particular test are typical of Hi-Qua-Led's performance in many applications. Further, when you use Hi-Qua-Led circular forgings you do not sacrifice any regular steel quality. Hi-Qua-Led in any AISI grade has the same attributes as regular steel of the same grade.

Investigate the possibilities of Hi-Qua-Led Steel in circular forgings from 18- to 145-in. OD. ALCO specialists will visit your plant to help you save the most from its machining potentials. Contact your nearest ALCO sales office, or write Spring & Forge Division, Dept. OCF-3, P. O. Box 1065, Schenectady 1, N. Y. for brochures.

ALCO

ALCO PRODUCTS, INC.

NEW YORK

Sales Offices in Principal Cities

Locomotives • Diesel Engines • Nuclear Reactors • Springs • Steel Pipe • Forgings • Oil-Field Equipment

ALLIS-CHALMERS.

Products for steel: motors, m-g sets, rectifiers, control, pumps, *Texrope* drive equipment, crushers, grinding mills, screens, transformers, unit substations, switchgear, circuit breakers, turbine-generators, voltage regulators, blowers, compressors, condensers, and water conditioning equipment.

Texrope is an Allis-Chalmers trademark.

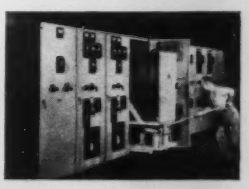
ALLIS-

. in Step with STEEL

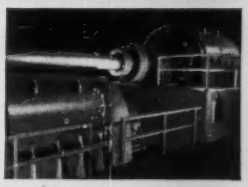
The Hot-Strip Mill

Reliable drive power to roll steel with speed and precision is provided by Allis-Chalmers hot-strip mill equipment. Powerful, specially designed driving components keep slabs moving round the clock to help steel producers keep pace with mounting demands. Step by step, Allis-Chalmers helps STEEL reach new production levels — set new standards in quality.

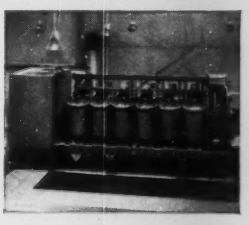
From mine to final processing, Allis-Chalmers equipment is in step with the tempo of expanding steel production. Contact the nearest A-C office in your district, or write Allis-Chalmers, Milwaukee 1, Wisconsin.



Switchgear is specially designed by Allis-Chalmers to bring high voltage to load centers, with resultant economy in cable costs, minimum line loss, efficient regulation, and complete protection.



Dc motors — Precision speeds for hot-strip mill performance are provided by a wide range of dc motors powered by supporting motor-generation sets or rectifiers.



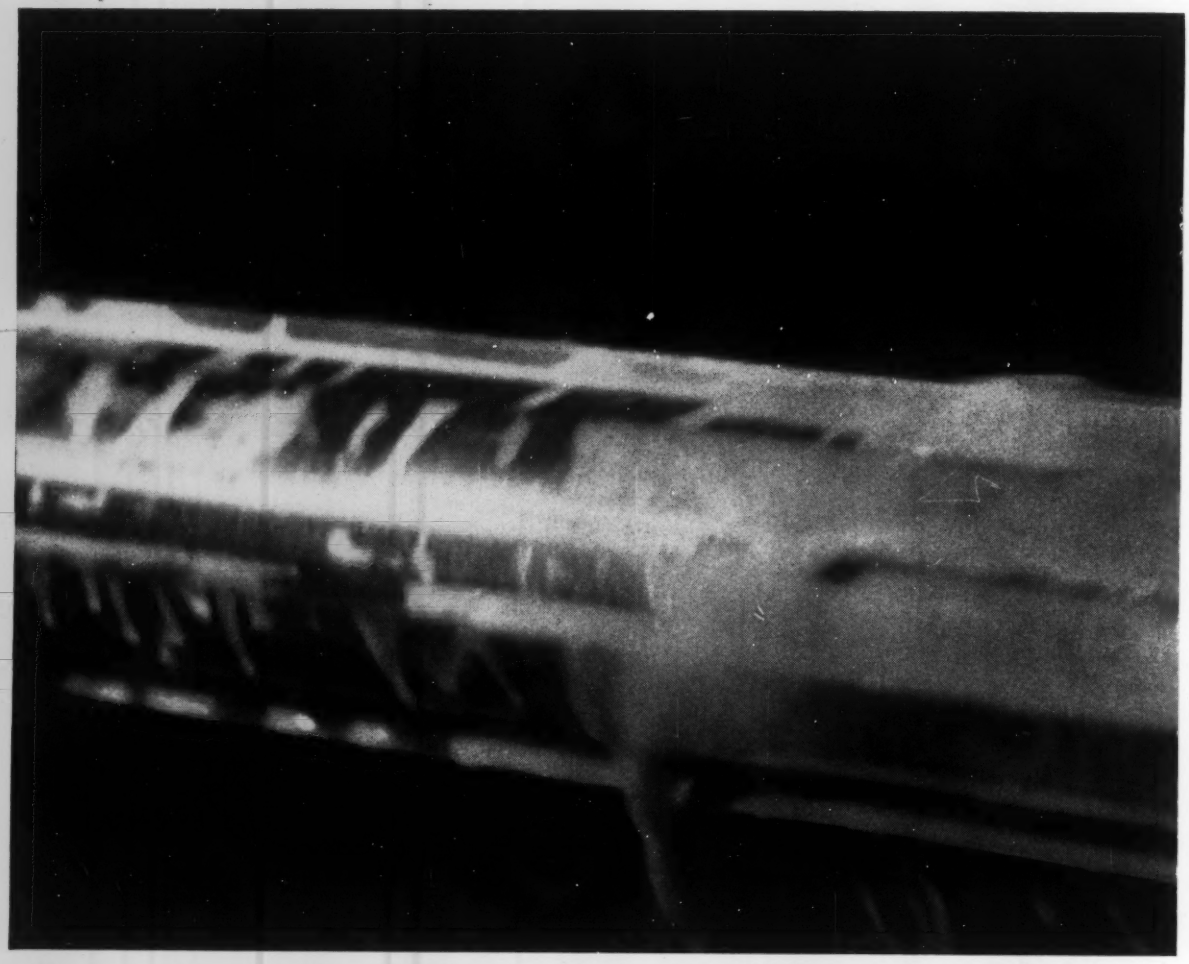
Mercury arc rectifiers furnish variable voltage dc power in support of dc drive motors. They are low cost, high efficiency units providing fast response to control signals, resulting in better voltage control and reduced maintenance.

For hot-strip mill operation, Allis-Chalmers also supplies mag-amp regulators, and auxiliary motors and control.

CHALMERS

A-C ALLIS-CHALMERS

A-5413



He Socked That Bit in

There's always a way to get **more work** out of the machines you **have . . .** and here's an example.

It was kind of a "put up or shut up" demonstration. The Houghton Man told us we could cut metal faster with his ANTISEP All Purpose Base than with the cutting fluid we were using. We told him to prove it.

He did. With all of us in the shop watching, he had the machine set up (it was one of the oldest we have) and then fed that bit into the work faster than any of us had ever dared.

We all wondered what would break first, but nothing broke. We were convinced.

The higher speeds and faster feeds ANTISEP Base makes possible can boost production in your shop just as easily. And you'll get other benefits. ANTISEP is economical to use because you mix it 1:25 with water. Its cost—in the machine—is low.

Work is protected from rust by a powerful preventive mixed right into ANTISEP Base. And ANTISEP doesn't smoke, won't let chips build up, won't turn rancid.

Finishes are top-grade, even with the heaviest feeds, because ANTISEP cools as no oil can.

ANTISEP All Purpose Base is the heavy-duty member of a whole Houghton family of superior cutting oils and bases. Ask the Houghton Man about them today.

so Hard it Scared Us

HOUGHTON'S FAMILY OF CUTTING OILS AND BASES:

Cut-Max	Series of fortified ready-to-use cutting oils and concentrated bases for dilution by user.
Antisep All-Purpose Base	Miscible with either water or oil; for 90% of all machining uses.
Antisep Soluble Oil	Antiseptically treated; detergent action; releases grinding dust.
Houghto-Grind 50	Grinding concentrate; stops rust, won't load wheel.
M. M. Honing Oil	Beats kerosene for honing.

ANTISEP BASE

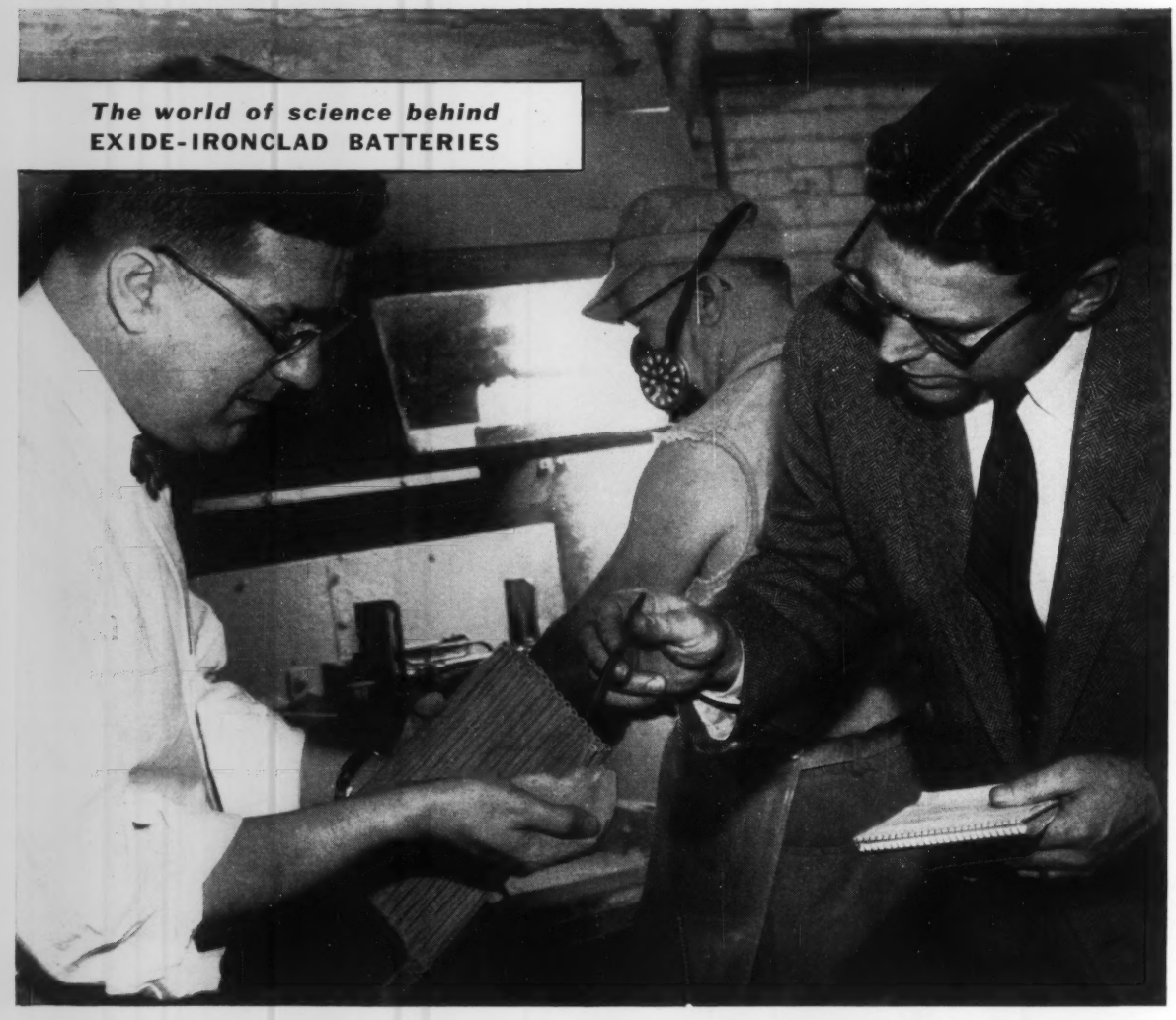
...a product of

E. F. HOUGHTON & CO.

PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service...

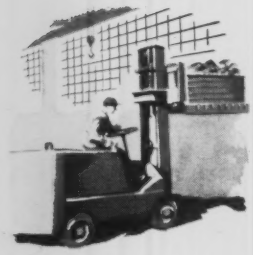
The world of science behind
EXIDE-IRONCLAD BATTERIES



Being interviewed is E. A. Wagner, Product Engineer

"This oxide blend packs more power per ounce"

At the Exide Laboratories—**Reporter:** More power, Mr. Wagner? Do you mean the blend of oxides in Exide-Ironclad is different from that used in other batteries?



Wagner: Absolutely. We can use the more active oxides that give the batteries higher capacity.

Reporter: Why do you say *can?* Can't other batteries use these oxides too?

Wagner: It isn't likely. First, this blend is the result of more than 40 years of Exide research—and it's an Exide exclusive. Second, we can use it successfully because of the unique tubular construction of the Exide-Ironclad positive plate.

Reporter: How does tubular construction help make it a better battery?

Wagner: Because the cylindrical power tubes hold the tiny oxide particles firmly in electrical contact clear through the charge and discharge cycle. So Exide-Ironclad Batteries can maintain their high capacity—even under severe vibration—for years of service.

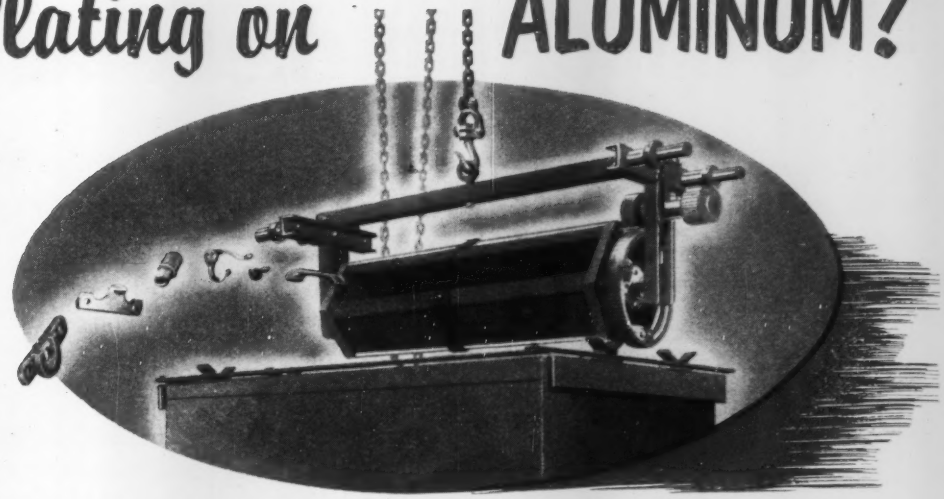
Reporter: Obviously, this is an important feature of Exide-Ironclad Batteries.

Wagner: Yes it is, but it's just one of many engineering details that contribute to its high capacity and long life.

Note to battery users. Whenever you order heavy duty batteries or the equipment that requires them, be sure to specify Exide-Ironclad. For bulletin, write Exide Industrial Division, The Electric Storage Battery Co., Phila. 2, Pa.

THE ELECTRIC STORAGE BATTERY COMPANY **Exide®**

Plating on ALUMINUM?



use ENTHONE

ALUMON®

For these Reasons . . .

- Years of successful use by hundreds of manufacturers.
- Easy to operate.
- Very economical – costs less than ½¢ per square foot of surface plated.
- Skilled chemists work out your plating cycles and aid you in the plant.
- Alumon is a quality product of high purity materials and is exactly formulated to insure consistency of result.

Write for literature on Alumon and check list of literature on sixty Enthone products and processes for better metal finishing.

Service Representatives and Stock Points in Principal Cities of U.S.A. and Canada, Brazil, England, France, Sweden, and Germany

ENTHONE INCORPORATED

442 ELM STREET, NEW HAVEN 11, CONNECTICUT

Metal Finishing Processes • Electroplating Chemicals

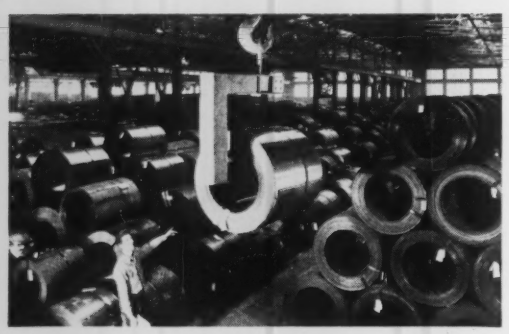
3 important check points on steel suppliers

for the buyer with a management viewpoint

In 1917 Ryerson already had 75 years of steel-service experience

DEPENDABILITY AND EXPERIENCE—Is your company establishing a sound business relationship with a supplier of steel from stock who will be willing and able to furnish steel at fair prices next year or five years from now under all market conditions? And is your company dealing with a supplier who can give you the benefit of experience gained in working with tens of thousands of other companies whose problems of steel purchasing, selection and fabrication may be similar to yours?

The supplier with the broadest experience is Ryerson—the nation's largest steel-service organization with a 115-year record of dependable performance.



A small part of the huge steel stocks at one Ryerson plant

CAPACITY TO SERVE—Consider this recent example: It was 10 after 5 P.M. The phone rang and a steel buyer 80 miles away said: "I've got to have 60,000 lbs. of slit coils first thing in the morning." Impossible? Not at Ryerson. The needed steel was on hand in Ryerson stocks—the nation's largest, by far. Unequalled processing equipment was put to work. And during the night coils of two different gauges were slit to size requirements. Early the next morning the steel was delivered as promised—80 miles away. This kind of service takes great capacity—and Ryerson has it.

Spark testing Ryerson bar stocks to avoid mixed steels

QUALITY OF PRODUCT—Mislabelled steel cannot pass skilled Ryerson inspectors who "read" steel sparks to determine carbon content and alloying elements with amazing accuracy. And spark testing is typical of the exacting attention given to quality control at Ryerson. As a result you are sure of getting the third important requisite of satisfactory steel service—steel of known, uniform high quality, accurate in size, gauge, length and weight, and right for your particular application.

In stock: Carbon, alloy and stainless steel—bars, structurals, plates, sheet and strip, tubing, reinforcing steel—aluminum, industrial plastics, metal-working machinery, etc.

RYERSON CERTIFIED QUALITY

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

STEEL

August 12, 1957

Metalworking Outlook

Rail Equipment Agency?

The railroads have little hope of gaining Congressional approval of their proposal for a federal agency to help with equipment purchases. The 34 eastern roads which advanced the idea claim an agency with an initial capital of $500 million could be self-supporting in purchasing rolling stock and then leasing it to the railroads. Congressmen know there are few self-supporting government bureaus even though some were established with the belief that they would be. The public's pressure for economy will make it tough for the legislators to O.K. the ideas.

Atomic Merchant Ship by 1960

"The nuclear age for merchant shipping is closer than you think," says Clarence G. Morse, maritime administrator. The keel of the first atomic merchant ship will be laid in 1958; the vessel will sail in 1960. From a cost standpoint, the atom ship will pay off in long hauls where it won't need to use part of its cargo space to carry conventional fuels.

Pan-American Roads Nearly Done

Look for the long awaited Inter-American Highway to be ready for traffic by the end of 1958, says Walter Williams, under secretary of Commerce. It will be an all-weather, two-lane road. Now, 1011 miles of the 1573-mile length are paved. Congress is being asked to appropriate an additional $10 million to pave the last 562 miles.

Missiles Lead Electronic Sales

The electronics industry will mark up more than $3.5 billion in sales to the military this year, compared with $2.8 billion last year. About $1 billion of 1957's volume will be for guided missiles. Industrial electronic volume this year should hit about $1.3 billion, compared with $50 million last year, estimates Electronics Industries Association (formerly called Radio-Electronics-Television Manufacturers Association).

Tempo Rising for Transistors

Annual sales of transistors and other semiconductors could reach $1 billion by 1967, predicts James H. Sweeney, marketing manager for General Electric Co.'s Semiconductor Products Dept. In 1957, semiconductor sales will exceed $140 million. That's 82 per cent more than the sales of $77 million in 1956 and 40 per cent over what most market analysts predicted last December for 1957.

Aircraft Jobs To Drop 40,000

Watch for aircraft employment to slip about 40,000 by yearend from the 900,000 peak. The shift in Defense Department emphasis to missiles will

Technical Outlook—p. 123 Market Outlook—p. 169

also affect another 60,000 in the industry in reduced weekly hours, claims A. C. McGraw of the International Association of Machinists. However, aircraft employment hit a high of 908,600 in March, 1957, compared with 772,600 in March, 1956. So, the aircraft and parts industry this year may still be the nation's largest single employer, as it was in 1956.

Better Finance Deals Needed

About 22 per cent of new production equipment sold to metalworking this year will be automated, says Edwin B. Meredith, consultant for Foundation for Management Research. About 18 per cent of that sold last year was automated, he believes. He thinks the percentage could be even higher if more money were available. Needed are more liberal terms. At least one finance company now requires only 10 per cent down and three years to pay. Standard terms are one-third down and 24 months to pay.

Testy Testimony in Steel

Describing himself as "a simple iron puddler," U. S. Steel Corp.'s chairman, Roger Blough, last week faced Sen. Estes Kefauver's subcommittee investigating pricing. He answered charges against U. S. Steel and the industry by citing "shopworn economic concepts and warmed over theories" as no solution to current problems. He was referring specifically to the hullabaloo raised by earlier testifiers over administered prices (STEEL, July 22, p. 57). Mr. Blough pointed out that: 1. In this country no one company, industry or union can alone stop inflation. 2. Neither steel nor any other single industry sets a wage pattern.

New Markets for Chain Saws

Development of new alloy steels is sparking growth of an industry with a sales volume exceeding $40 million. Chain saws have existed for at least 25 years, but they were slow and heavy. Sharon Steel Corp. is among the pioneers to develop high carbon-chromium-nickel-molybdenum steels for saw chains and guide bars which made possible use of fast motors. In commercial lumbering alone, sales jumped from 50,000 units in 1950 to 300,000 in 1956. Unsaturated markets also exist among farmers, utilities, nurserymen.

Straws in the Wind

Lykes Bros. Steamship Co. Inc. has signed a $500 million contract with the Maritime Administration to replace 53 ships over the next 14 years; the job will provide 50,000 man-years of work for U. S. shipyards and $240 million in sales of material and equipment outside the yards . . . Users of the St. Lawrence Seaway will meet in September to discuss tolls . . . Neil McElroy, president of Procter & Gamble Co., will be the next secretary of defense . . . A market exists for 5000 small scale computers over the next five years.

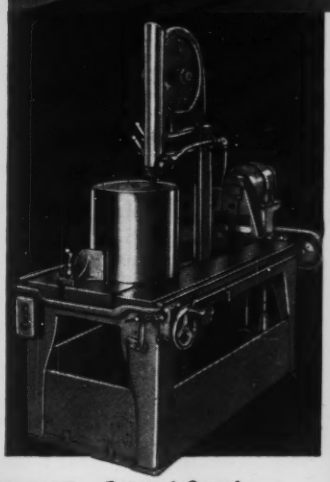
MARVEL NO. 8 BAND SAW makes a tough job EASY...

FLOOR TO FLOOR IN 5 HOURS... no special jigs, fixtures or set-up required

The versatility, simplicity of operation and unmatched efficiency of a MARVEL No. 8 Universal Metal Cutting Band Saw makes it the best all-around saw you can buy.

Take the job illustrated, as an example. Three equally spaced re-entrant cuts were required to segment a large, heavy die forging. The work was merely placed on the table between the vise jaws with the first lay-out line positioned to bisect the blade. Feed pressure was set on the direct-reading scale and the cut started. On a MARVEL No. 8, the work is always stationary and the blade is fed into the work; the cutting edge of the blade is always square with the table throughout its full feed traverse, which eliminates the need for special fixtures. The pre-set Automatic Overload-Relief Power Feed kept the blade moving into the work only as fast as it could freely remove the metal; as the vertical length of the cut decreased, the blade was automatically fed faster, thus increasing cutting speed. Upon completion of a cut, the blade was rapidly returned to its starting position by a rapid traverse handwheel located at the operator's position. Succeeding cuts were made in the same manner, with the same ease and speed.

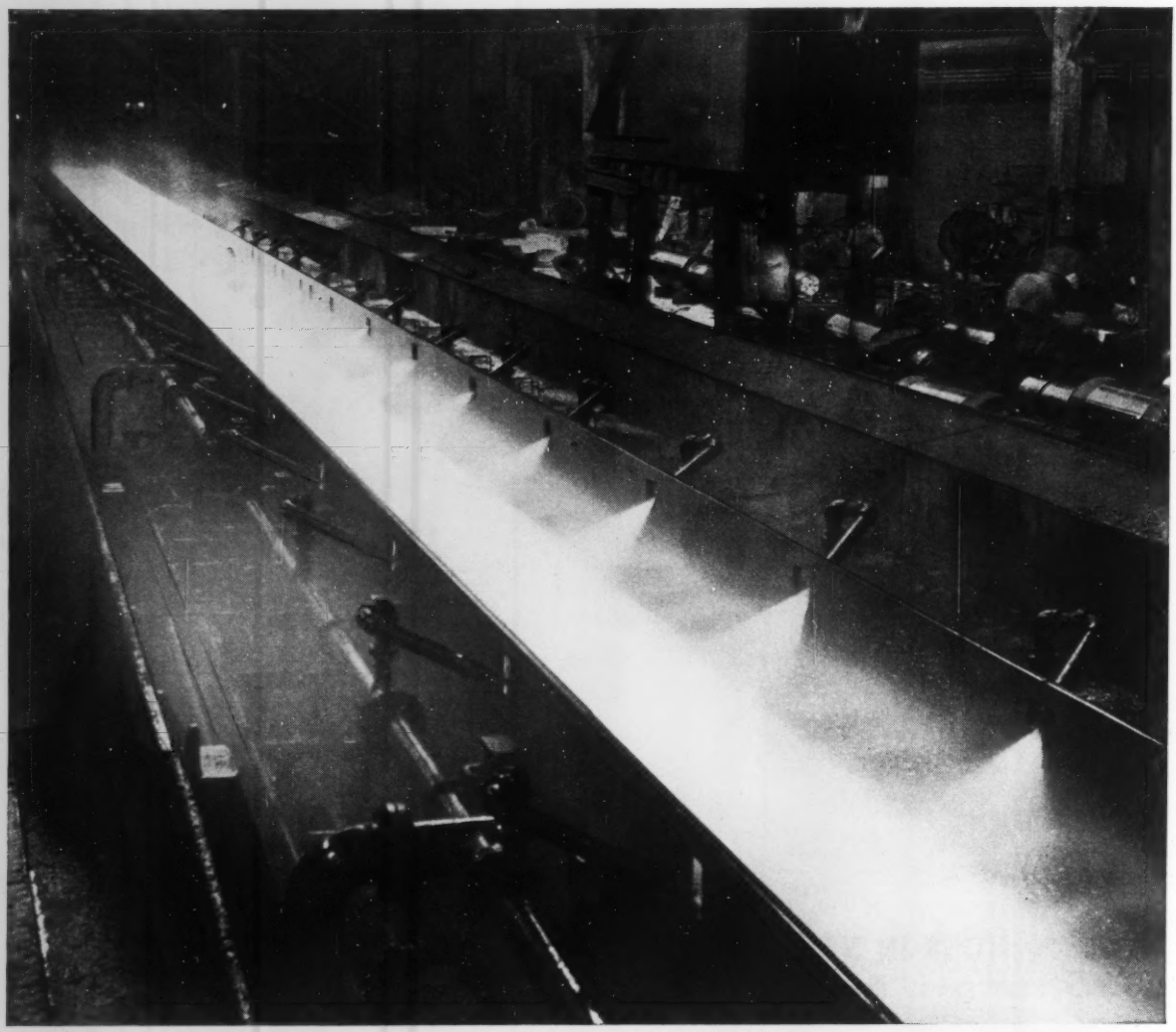
Jobs like this aren't done every day, but they serve to emphasize the versatility of the MARVEL No. 8, a truly universal metal cutting saw. If you cut, machine or fabricate metal, this is a sawing machine you should know about. Write for catalog.



ARMSTRONG-BLUM MFG. CO.
5700 BLOOMINGDALE AVE. · CHICAGO 39, ILL.

MARVEL Metal Cutting SAWS
Better Machines–Better Blades

S-1302



Ductile Iron Runout Rolls in a continuous hot-strip mill help turn out thousands of tons of steel strip daily at Weirton Steel Company, Weirton, West Va. The rolls have an OD of 12 inches and measure 60 inches long.

Weirton stops thermal cracking with ductile cast iron runout table rolls

Over 60 ductile cast iron runout table rolls are already in service on the new 54-inch, continuous, hot-strip mill at Weirton Steel Company, division of National Steel Corporation.

Weirton plans to replace *all* the mill's original cast iron rolls as they wear out, with the new ductile iron type.

Weirton is changing because tests showed ductile iron rolls outlast any rolls used before. They resist warpage and cracking under thermal shock. They are tougher and, consequently, stand up under continuous shock and vibration. And, ductile iron rolls have good wear resistance.

As a result a big maintenance problem is solved . . . replacement costs are lowered . . . and expensive shutdowns are reduced to a minimum.

Take advantage of ductile cast iron. See if it won't reduce maintenance costs for you in your own plant. It has proven economical for charging boxes, furnace doors, ladle rings, sintering grates and many other applications.

All the important information you want to know is given in our booklet "Ductile Iron, the Cast Iron That Can Be Bent." Successful applications are shown, grades of ductile iron are listed and mechanical properties are compared with cast iron, malleable iron and steel. For your copy write to:

The INTERNATIONAL NICKEL COMPANY, Inc.
67 Wall Street, New York 5, N. Y.

ductile iron...the cast iron that can be twisted and bent.

The New Technology

In the minds of many, there is a lot of mystery in the new technology.

But as the editors of STEEL point out (Page 113), it's nothing to shy away from. It is based 90 per cent on what's already established, 10 per cent or less on what's new. It doesn't take a plant full of supermen to understand it or benefit from it.

If you are not already in it, you probably are being affected by it or inevitably will be in the near future.

In materials, the new technology encompasses the new superalloys made possible by the vacuum melting process, as well as the metals once considered rare (like beryllium, titanium, zirconium, and germanium) but which now are available in quantity.

In processes, it takes in the new and improved methods for melting, stamping, extruding, roll forging, welding, machining, and testing.

In products, it ranges from shields for atomic reactors to canned pumps, control instruments, and tiny transistors.

In markets, it means business in the billions. For example, the transistor, introduced in 1948, had sales totaling $60 million in 1956. By 1960, they will grow to $300 million.

You can benefit two ways from the new technology: By making products for it, or by applying its benefits to what you're already making.

You will need to find out what is needed and what you can make. It means checking the competence of your technical staff and the adequacy of your production and testing equipment.

For your present business, you will need to see how new designs, new processes, and improved versions of old processes can be applied to the products you make.

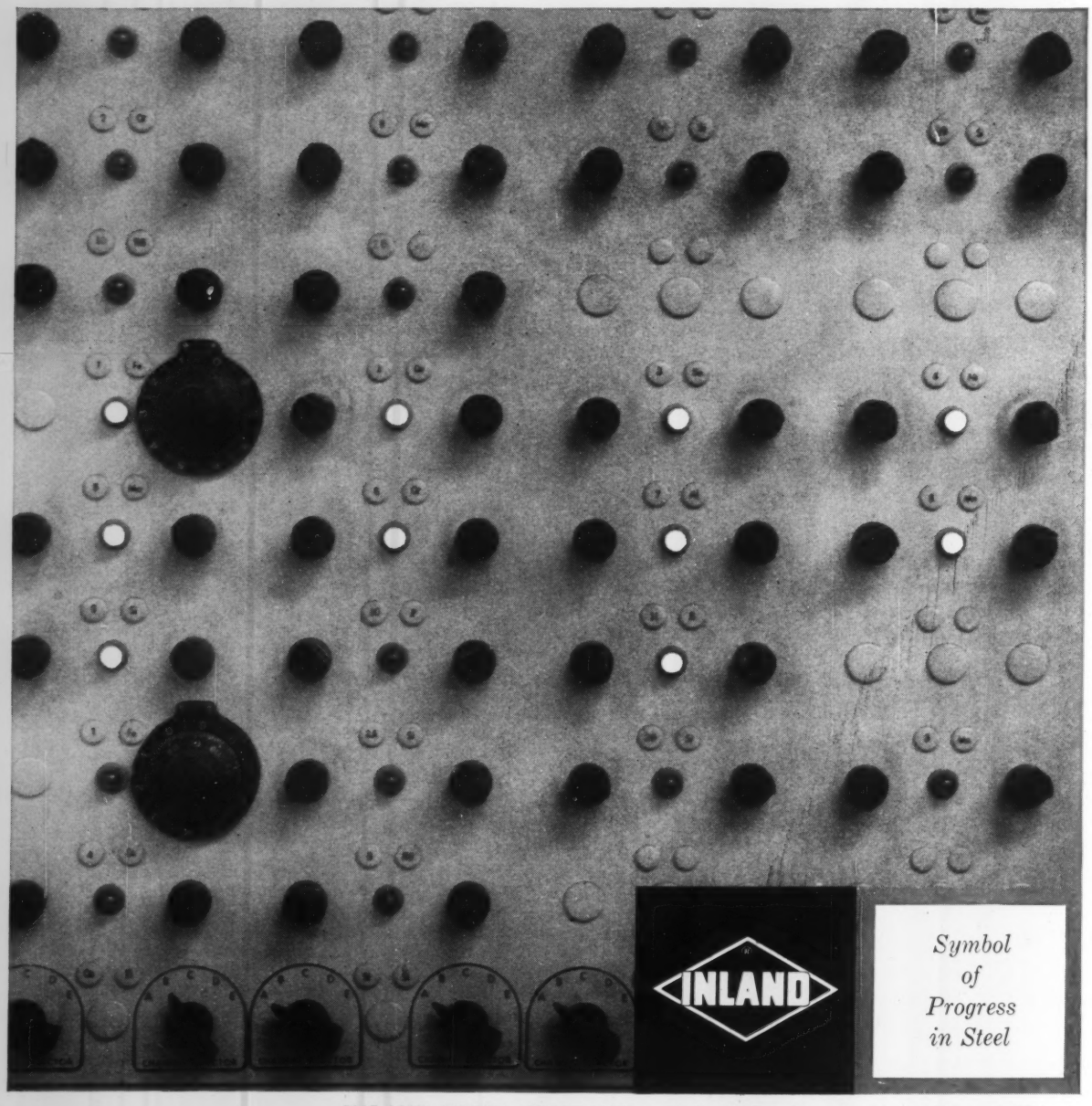
Many people instinctively fear the new because it upsets their customary ways of doing things. We suspect this explains why some companies are reluctant to apply the new technology.

We prefer to think of it in terms of the untold opportunities it is opening up for industry.

Irwin H. Such
EDITOR-IN-CHIEF

Tilt!

From Inland open hearth furnaces, some over a mile away, steel samples speed through pneumatic tubes, converge at a central laboratory check point. Formerly, chemical analysis meant lost time, slower production schedules. Now, modern electronic devices make special analyses, instantly record the presence and amounts of each chemical and mineral element. Across the panel of this direct reading spectrograph, lights flash—warn if an element exceeds plus or minus limits. Within minutes, instructions rush back to the open hearth crew to complete or divert the heat. It is one of scores of controls assuring that the steel you buy from Inland will be . . . "as ordered!"



INLAND STEEL COMPANY • 38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport • St. Louis • Kansas City • Indianapolis • Detroit • New York

Precision Castings Co. Inc.

Tool and Die Shops See:

SALES:
At record pace.

BACKLOG:
Down 30 per cent.

ORDERS:
Low but rising.

LABOR:
A serious shortage.

HOURS:
About 50 weekly.

Diemen Expect Good Year

Metalworking's bellwether industry looks forward to a second consecutive billion dollar year, despite lower backlogs and first half dip in orders. Sales are up 12 per cent

THE NATION'S tool and die shops are headed for their second consecutive billion-dollar year. It's a good bet that they'll surpass their 1956 mark (estimated by industry leaders at $1.1 billion). But they'll need a second half upswing if they hope to match 1956's peak third quarter pace.

George Eaton, executive vice president, National Tool & Die Manufacturers Association, estimates the 1957 dollar volume at $1.1 billion plus. Sales so far in 1957 are running about 12 per cent ahead of 1956's.

The picture is not uniformly rosy. Backlogs are lower; incoming orders are considerably below last year's record pace; and the shortage of tool and die makers continues.

Backlogs Down—They're only 70 per cent of 1956's midyear level. NTDMA attributes this to a continued high rate of manhours worked (about 50 hours per week is the current average) and a decline in orders.

Since customers demand rapid service, small backlogs can be a good condition. Says a Pittsburgh manufacturer: "For a contract shop to make a profit, it must ship fast, produce long runs of standard products and hold down costs by investment in tooling."

Orders Dipped . . . —On the average, the 3000-plus shops have about 12 per cent less orders so far this year than they did in the like '56 period. The decline is mainly in automotive and construction areas.

But Will Bounce Back—Industry leaders expect a rise, but they doubt that it will match 1956's sharp upsurge. John Barth, vice president, Barth Corp., Cleveland, expects a 10 per cent increase.

With carmakers planning major changes in their '59 models, automotive tool and die shops look to a busy 1958.

Help Wanted — There's still a serious shortage of tool and die makers. B. Jahn Mfg. Co., New Britain, Conn., could use 40 more. The Chicago area needs 720 more craftsmen, estimates the local tool and die institute there. Quality is also a problem. Allen Tool Corp., Syracuse, N. Y., wants "five top grade" makers.

Few manufacturers, except in

the Detroit area, report a need for apprentices. Most have a waiting list. But it takes about ten years to train a man to become a journeyman tool and die maker, says Modern Tool & Die Co., Cleveland. Also, in the few unionized shops, the union limits the number of apprentices. Mr. Barth feels a shop should be training one apprentice for every six journeymen.

Though some consider the present 50 hours a near-optimum work week, others prefer the 55-hour week prevalent at this time last year. About 30 per cent of the shops surveyed by STEEL work less than 48 hours weekly now.

Customers—Orders from business machine makers are up considerably. The same holds true for the instrument, electronic, and electrical industries. Aircraft orders were high, but a drop is expected, reflecting the change in the military program.

Orders from the two biggest customers—the auto and appliance industries—fell. But most manufacturers think a rise is just around the corner. Military contracts—especially for missile work—are up about 5 per cent.

Prices Steady—Most firms raised prices 5 to 10 per cent last year or expect to hike them that much this year. Some firms have absorbed rising labor costs. "Competition is keen; we have to hustle for every job," says Harig Mfg. Co., Chicago. It's quoting work at $7.25 to $7.50 per hour.

STEEL received several reports of price cutting. Tough competition, volume production, high costs, and lower backlogs are the causes. One producer reports cuts of 30 per cent on standard items.

Cancellations — They are up slightly but still average less than 3 per cent of orders. One eastern manufacturer reports that 8 per cent of his orders have been canceled this year, and a New York firm reports that many of its customers are postponing orders.

Exports-Imports — Canada is a growing customer for American tool and die shops. One Brooklyn firm reports modest sales to Mexico. Some foreign competition is being felt by automotive shops. "But," says one Detroit firm, "it doesn't warrant all the talk."

Trends—Complexity and precision are becoming the watchwords of the industry. Says Mr. Eaton: "Electronics, missiles, computers, and even appliances are getting more complex. Closer tolerances are demanded on many jobs. So there's a need for more precise equipment and skilled craftsmen."

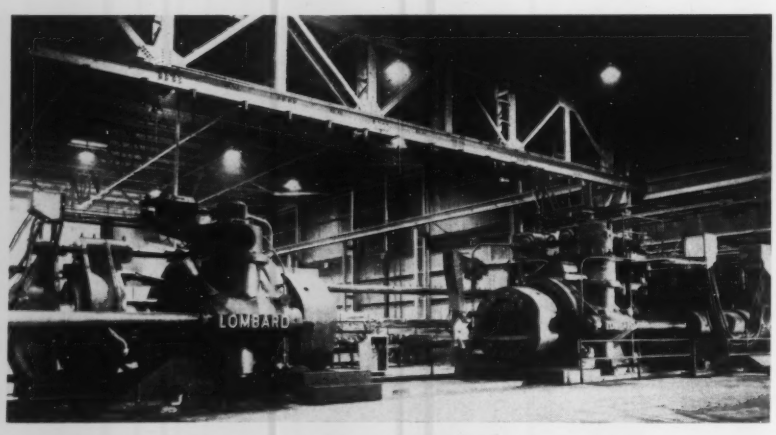
The trend to automation has greatly enlarged the market for special tooling. "Making special automated tools is becoming an increasing part of our business," says Mr. Barth.

What's New? — Plastic tools, jigs, and fixtures are gaining popularity for short runs (up to 20,000-30,000), standby tooling, prototypes, checking tools, foundry equipment, and manufacturing method development.

"Carbide lamination dies making over 3 million parts per grind are in use," states Leslie S. Fletcher, research and program director, American Society of Tool Engineers. For great accuracy in high activity dies, carbides are becoming popular despite high cost.

"Carbide is used in dies producing close tolerance parts or on highly abrasive materials as well as in high production stamping dies," reports Philip Harvey, assistant technical director, ASTE.

Other new methods (still semi-experimental): Electric discharge grinding, ultrasonic machining, explosive forming, and ceramic tooling.



1500-Ton Stretcher for Large Extrusions

Large extrusions (29½ in. maximum diameter) are straightened by this 1500-ton stretcher built by Lombard Corp., Youngstown. It has an over-all length of 172 ft and a range of 8 to 113 ft. The machine will be used to process extrusions produced by a 12,000-ton press at Harvey Aluminum Division of Harvey Machine Co. Inc., Torrance, Calif.

Hughes Defendant in Suit

An antitrust suit filed against Hughes Tool Co., Houston, claims that the company has made agreements with a German firm, Alfred Wirth, Erkelenz, Rhineland, Germany, under which Hughes will control the sale of tool joints, rock bits and other oil field equipment sold in this hemisphere.

The government accused the companies of having agreed on minimum prices and pooling their patents. Hughes denies the claims.

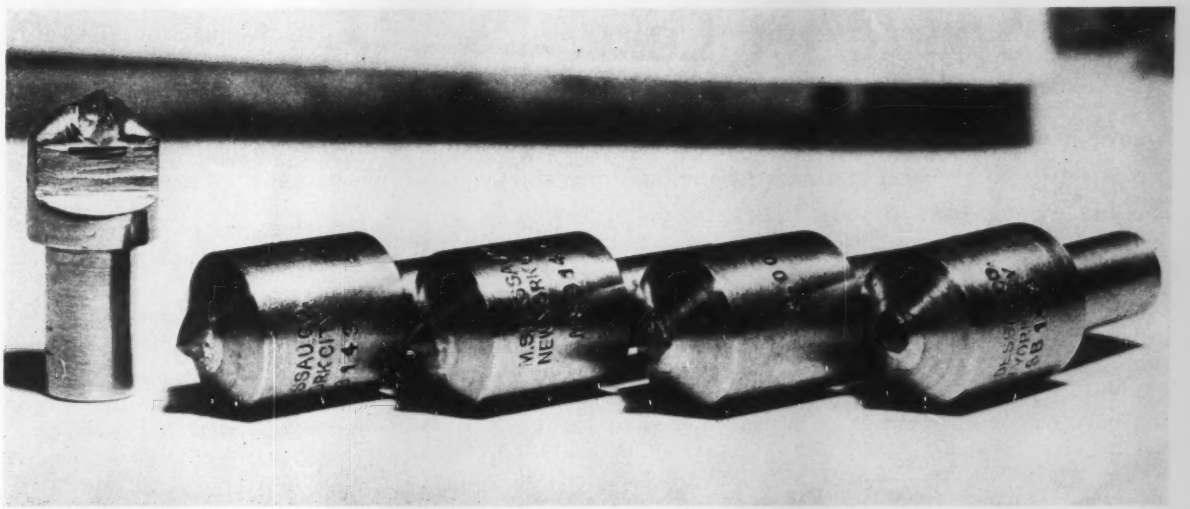
Attempts will be made to break Hughes's control of the patents, technical information, and trademarks as well as break up the alleged agreement.

Indian Study Completed

India should give top priority to the development of her own machine tool production under a second five-year program, states George Merryweather, vice president of tne Motch & Merryweather Machinery Co., Cleveland.

He heads up a three-man team that has just completed a survey of India's machine tool industry.

The group recommends that the Indian government provide certain equipment on a lease basis and that after the lease period the users should have the right to buy at cost, less licensing payments.



Cross section of dressing tool shows how diamond is embedded in steel

Maurice S. Dessau Co.

Diamond Market Active

New uses and continued high demand from regular customers prompt industrial diamond producers to expect 1957 to surpass 1956. Imports are up, prices steady

WHILE SLOWER operations in the automotive and aircraft industries are leaving their mark, demand for industrial diamonds continues active.

"Business in 1957," says the Industrial Diamond Association of America, "should be at least as good as last year's. And while there is less demand in some categories, demand for boart and diamond boart products should be greater than in 1956."

Reports from overseas indicate that sales of industrial diamonds for the first five months this year were greater than for the corresponding period of last year.

Outlook Bright—Bolstering the outlook are indications that the metalworking industry, the major consumer of industrial diamonds, will have a near-record year. Activity in the mining, oil drilling, and glass industries, other large consumers, is being fairly well sustained and requirements of the plastic and rubber industries are rising.

Also helping demand: Development and use of harder materials which often require more grinding than turning; recognition of the value of better finishes, and development of new equipment.

New Uses—Frank Blaine of Maurice S. Dessau Co. says: "New design in aircraft engines, particularly on blade grinding, has created a need for a tremendous amount of shape tools, accurately fabricated. Also, impregnated dressers have been developed for various types of grinding.

"The electronic and instrument fields have created demands for specially shaped diamonds for contact and light refraction. Ceramic tools require diamond wheels for sharpening and shaping. New uses for industrial diamonds are being developed for the processing of ferrite, germanium, and other materials not yet available to the general industry."

Use of metal-bonded diamond segmental blades for cutting contraction joints in concrete highways and airfields has been stepped up considerably over the past two years.

Prices—While demand is active, supply is plentiful, reflecting cessation of government purchases for stockpiling. No surplus, however, is noted in crushing boart or diamond powder—particularly in sizes ranging from 80 to 220 mesh.

Prices are easier on the poorer quality of diamonds but fairly steady on the better quality. Prices on crushing boart have gone up.

Artificial — Manmade diamonds have not affected supply, as only token quantities of this material have been produced and none have been extensively marketed. General Electric Co., which created a stir in 1954 with its first artificial diamond, is supposed to be bridging the gap between the first experiments and the production line. Its two main areas of concentration are quantity production and achievement of a marketable price.

A spokesman for Carborundum Co. says: "Manmade diamonds have not affected the market for natural diamonds due primarily to price and availability. If and when the production of manmade diamonds increases materially, the price will probably go down with a definite possibility of making this product directly competitive with natural diamonds."

New Source for Coke

American Gilsonite produces a high purity metallurgical grade that can be used in making aluminum and steel alloys. The fuel comes from a solid hydrocarbon occurring in Utah

A NEW source for high purity metallurgical coke is provided by the coking plant and refinery just opened by American Gilsonite Co. near Grand Junction, Colo. Using Gilsonite, a solid hydrocarbon occurring as a freak-of-nature mineral in the Uintah basin of Utah, the company makes coke that is more than 99.5 per cent pure carbon and which has a sulfur content of less than 0.25 per cent.

First shipments of the Gilsonite coke will go to aluminum reduction plants where it will be used in making anodes. The low sulfur content makes it much desired for aluminum reduction and in the making of special steel alloys.

Premium Product — Only drawback to the more extensive use of high purity metallurgical coke in the making of the finer steels, alloys, and aluminum is its scarcity. American Gilsonite's output will be only 275 tons a day, far below the demand for the product. The company expects to get a premium price for its coke, although first shipments are going out at $30.50 a ton, the going price for petroleum coke.

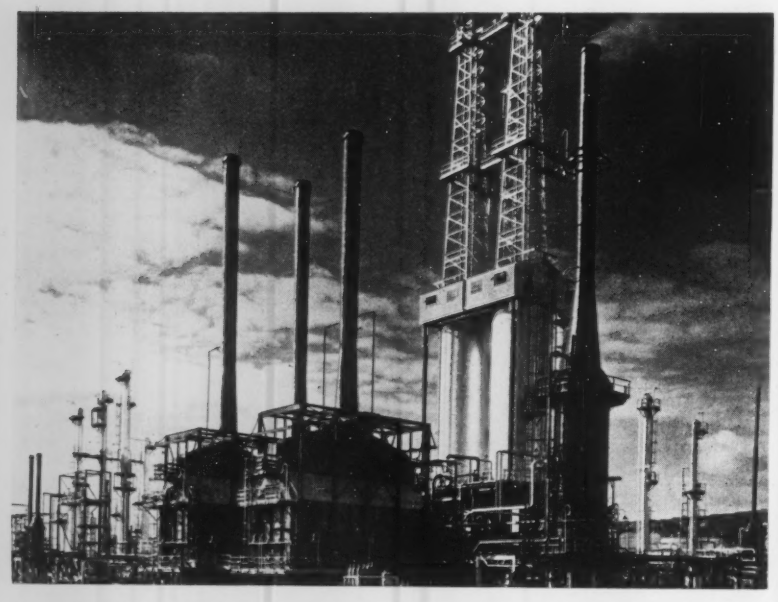
American Gilsonite, unlike many refining companies, regards coke as a profitable end product. The only other commercial product of the refinery is 1300 barrels of gasoline a day.

Unique Mineral — Gilsonite resembles an asphaltite, but has a high resin content and little sulfur. It was formed some 60 million years ago when massive upheavals of shale forced partially decomposed organic material upward into stress cracks. Over the intervening ages, the liquid organic material was changed by polymerization, heat, and the action of mineral catalysts into the solid.

The material is mined by powerful jets of water to reduce the explosion hazard, and transported 72 miles from the mine at Bonanza, Utah, to the refinery by a 6-in. pipeline (STEEL, July 1, 1957, p. 37) as a slurry.

At the refinery the slurry is treated just like crude oil.

American Gilsonite is jointly owned by Standard Oil Co. of California, San Francisco, and Barber Oil Corp., New York.



This $16 million coking plant and refinery is near Grand Junction, Colo.

AISI Compares Consumption

The iron and steel industry used a record amount of electric power in 1956, the American Iron & Steel Institute notes.

The total was 35,833 million kwhr, or about 3 per cent more than in 1955, former record year. The industry generated about one-third of the power, bought the rest.

Consumption of some alloying elements by the industry also set records last year. They included: Manganese, 746,266 net tons; molybdenum, 13,763 net tons; nickel, 47,608 net tons; and titanium, 2819 net tons, contained weight.

The industry used about 98 million net tons of coal, against 100 million in 1955; over 2.2 million gallons of fuel oil, a slight decrease; and 269,577 million cu ft of natural gas, a slight increase.

The AISI reported efficient use of blast furnace raw materials in making pig iron last year. The 1956 consumption of iron ore, scrap, mill cinder scale, limestone, and coke per ton of iron produced decreased 3.4 per cent from the 1955 level to a total of 3.014 net tons.

During 1956, the industry's total consumption of iron ore was 134.0 million net tons, compared with 138.8 million in record 1955. Iron and steel scrap consumption was 63.2 million net tons, down less than 800,000 tons from the 1955 peak. The use of limestone and other fluxes was nearly 35.6 million net tons, compared with the 38.3-million-ton record set one year before.

Platinum-Group Sales Up

Domestic sales of metals in the platinum group were 3 per cent higher in 1956 than in 1955, the U.S. Bureau of Mines reports. Sales of palladium increased 16 per cent; platinum decreased 5 per cent; idium, osmium, rhodium, and ruthenium dropped 11 per cent.

Housing Starts To Improve in '58

1958*	1,100,000
1957*	970,000
1956	1,118,000
1955	1,328,900
1954	1,220,400
1953	1,103,800
1952	1,127,000
1951	1,091,300
1950	1,396,000
1949	1,025,100

Source: Bureau of Labor Statistics.
*Estimated by STEEL.

FHA Changes Aid Housing

Higher interest rates (5.25 per cent instead of 5), lower down payments ($600 on a $12,000 house) and more available money in 1958 will push housing starts up

REACTIONS to the Federal Housing Administration's new regulations are cautious. No one expects the new rules to provide the necessary catalyst to push this year's housing starts over the million mark.

However, many expect it to boost 1958 construction. Says James Dawson, economist for the National City Bank of Cleveland: "Housing starts in 1958 will go over 1 million in the privately financed category alone."

FHA Changes — The new rules increase the interest rate from 5 to 5.25 per cent and cut down payments as much as 50 per cent. FHA mortgage "discounts" were limited to 2.5 per cent in most parts of the country.

Factors for '58 — Although the interest rate hike of 0.25 per cent is not expected to help much immediately, because of the shortage of money, it will aid in 1958 when there is more money available, because industry is expected to spend less for plant and equipment.

Says one bank executive: "Why make an FHA loan at 5.25 per cent today when we can tie up all our money in conventional loans at 6 per cent?" but he adds: "Next year, when money will be generally easier, it will be feasible to place some money in FHA loans."

Payments High — Lower down payments mean higher monthly payments. This, coupled with higher interest rates may make it impossible for many people to buy. The effective interest rate is 5.75 per cent (5.25 interest plus 0.5 mortgage insurance).

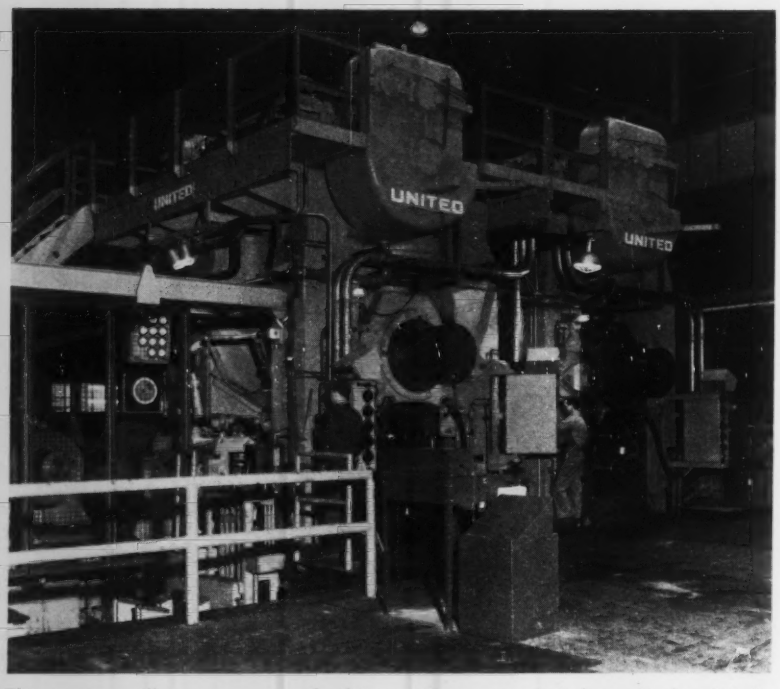
Disadvantages — Jay F. Zook Inc., Cleveland, feels that the changes are on the "too little too late" side. But J. F. Zook states: "It will help; housing starts should exceed 1.1 million in 1958." He adds: "The changes made by the VA served to almost completely knock out the possibilities of investment in new GI loans, although it does not affect those previously made.

Builders Speak — The National Association of Homebuilders (NAH) feels that the changes will enable many families to build who "have been trying to obtain better housing on terms they can afford."

Builders William J. Levitt expects a gain in housing starts this fall and a noticeable pickup next spring.

George Goodyear, president, NAH, comments: "These new terms will not add to inflationary pressures; they should channel a greater share of existing mortgage funds into lower cost housing."

All changes have already gone into effect. They apply to purchases of old and new housing.



This temper mill is among new facilities at Youngstown's Indiana Harbor Works

Youngstown Opens Mill

Tin plate facility latest addition to Indiana Harbor Works. It will be followed by a seamless tube mill, to be in full operation in early '58, and a new sintering plant

YOUNGSTOWN Sheet & Tube Co. has its new No. 2 tin mill at Indiana Harbor Works, East Chicago, Ind., in operation. For rolling and electrolytic plating of tin plate, it will require a work force of 500.

J. L. Mauthe, chairman, disclosed plans for a new sintering plant at the works and said that a seamless tube mill will be in partial operation in the third quarter and full production by early 1958.

Prices Follow Costs — The company has spent over $300 million on replacement and expansion since 1950. That can't be done unless prices follow costs, Mr. Mauthe emphasized. He termed the recent price increase "modest," pointing out that steel wages have gone up 70 per cent since 1950, but prices only about 40 per cent.

Facilities — The new mill will plate light-gage steel at speeds up to 2200 ft per minute. Normal rate: 1750 fpm. Supporting facilities include: a 54-in. hot strip mill, a 56-in., 4-stand cold reduction unit, a continuous annealing furnace, a temper mill, and a three-tier, 32-cell plating installation. The Halogen plating process is used.

The three shear lines have cutting speeds up to 1250 fpm. They're equipped with x-ray gages, pinhole detectors and classifiers.

The mill, made up of eight connected buildings covering 419,655 sq ft, is lighted by alternate overhead units of incandescent and mercury lamps.

Freight Costs Up

ICC increases railroad charges 7 per cent. Carriers may seek more as costs spiral

FREIGHT RATE increases granted railroads by the Interstate Commerce Commission will add about 7 per cent to the shipping charges consumers will have to pay for steel.

Example: Based on 40,000 lb per car, the minimum charge for shipping a ton of steel from Pittsburgh to Cincinnati today is $9.60 a ton. When the new rates go into effect (probably by the end of August) this charge will be $10.27 a ton.

Disappointed — "In view of the increased labor rates and increases in the cost of materials, we consider the decision very disappointing," commented Alfred E. Perlman, president, New York Central Railroad.

Eastern carriers had asked the ICC for a 15 per cent increase. Western roads wanted 17 per cent and southern lines requested 10 per cent. The increases approved were 7 per cent in the East and West and 4 per cent in the South.

Last December, eastern roads received a 7 per cent increase and those in the West 5 per cent. In February, southern lines got a 4 per cent boost. Since the end of 1956, freight rates have been boosted a total of 14 per cent in the East, 12 per cent in the West, and 9 per cent in the South.

Spiral — This is the thirteenth increase granted by the ICC since the end of World War II and puts freight rates 107 per cent above June, 1946. The ICC estimates that the current hike will provide $879.8 million in annual additional revenues.

Annual operating expenses of the railroads have increased $627 million in the last year and a half and will rise another $176 million a year Nov. 1 when wages go up.

"If costs keep on going up," says William T. Faricy, chairman, the Association of American Railroads, "it is entirely possible that this is not the last rate case before the commission."

He said the railroads might seek cargo differentials.

Opens Electric Stairway Plant

Westinghouse Electric Corp. completed a multimillion dollar plant near Dover, N. J., for the manufacture of electric stairways. Limited production will begin soon, with R. C. Robinson in charge of all operations. The 250,000 sq-ft facility is one of the major projects in the company's capital expansion and improvement program which this year will include outlays of $75 million.

Builds Acid Plant in Indiana

Stauffer Chemical Co. will build a $4-million sulfuric acid regeneration plant at Hammond, Ind., for processing oil refinery sludge acids. Full scale production is scheduled for July, 1958.

Alan Wood Unit Has New Plant

Penco Metal Products Division of Alan Wood Steel Co. has begun operations at its new fabricating plant in Oaks, Pa. Built at a cost of $2.5 million, the 156,000 sq-ft facility has more than three times the floor space of the plant it replaces.

Adds to Engineering Staff

Gregory Industries Inc., Toledo, Ohio, is increasing its field engineering staff 40 per cent. Leonard C. Barr, vice president, reports that specification work on building and product design problems has made engineering an important part of the firm's stud welding sales.

Steel Has Record Low Injuries

The iron and steel industry set a new record low for disabling injury frequency rate in 1956, reports the American Iron & Steel Institute.

The 1956 rate was 3.83 (versus 4.16 in 1955) disabling injuries per million manhours worked. The previous record low was 3.85 in 1954. The 1956 iron and steel rate was 40 per cent lower than the all-industry average of 6.38, according to National Safety Council figures.

In the last 30 years, the steel industry has lowered its rate nearly 82 per cent. The all-industry average declined about 75 per cent.

Salesmen's Incomes Rise

Survey shows that their pay is on the increase. Incentive payments range from 10 to 100 per cent of total compensation with 72 per cent of the firms paying bonuses and commissions

SALESMEN in the field now earn 4.3 per cent more (on the average) than they did last year, reports the American Management Association.

The study points out that salesmen who receive bonuses and commissions are paid lower salaries than those on salary alone, but they come out better in terms of total compensation.

A combination of salary and bonus is used by over 45 per cent of the companies surveyed.

Who Was Surveyed—The analysis was based on answers from 26,000 salesmen and 6000 sales personnel in 210 American and Canadian companies. More than 80 per cent of the salesmen earn between $5000 and $15,000 a year.

Positions include: Sales trainee, three grades of salesmen, sales supervisor, district sales manager, regional sales manager, and personnel engaged in market research and sales promotion.

Companies surveyed vary in size from $5 million to more than $500 million in annual sales volume. Each employs less than ten to more than 1000 salesmen.

Fringe Benefits — Salesmen are on the same basis as other employees in pension and group insurance plans. All the companies participating have group life insurance and hospitalization coverage for salesmen, and more than 90 per cent include salesmen in their pension plans.

Most of the companies pay all "reasonable" expenses while their salesmen are on the road.

Speed Tests Nose Cones

A nose cone for a ballistic missile is polished before a test flight of the X-17 re-entry rocket. The cone has a high quality surface to minimize the amount of heat created by high speed flight through the atmosphere. It is tested with a three-stage rocket that gives an accelerated plunge to the earth under power. This creates extreme temperatures.

Construction To Set Record

Construction contracts awards in 1957 will break the record $31.6 billion let in 1956, believes Thomas S. Holden, vice chairman, F. W. Dodge Corp.

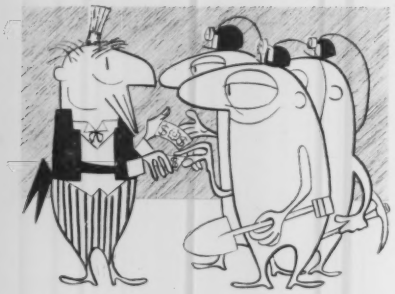
Mr. Holden bases his forecast on the fact that the $17 billion awarded during the first half is 5 per cent more than the figure for the same period last year. Contracts let in June this year totaled $3.2 billion, 10 per cent higher than they were in June, 1956.

Industrial construction accounted for the gains. Residential contracts are below 1956 levels.

Computer Aids Automation

Ramo-Wooldridge Corp., Los Angeles, has developed a digital control computer to be used as an automatic control for industrial process plants.

The fully transistorized computer, called the RW-300, was designed for use in metals processing, oil refining, and chemical manufacturing. It weighs 400 lb, is 55 in. long, 28 in. wide, and 36 in high.



Will Lead, Zinc Props Set Precedent?

THE HOUSE of Representatives is not enthusiastic about higher tariffs on imports to protect the domestic lead and zinc industries. The House also doesn't think too much of subsidies as a cure for sick mines, but it is forcing itself into a position when, in 1958-60, you may see a wholehearted endorsement of mining programs designed along the lines of our present policies toward domestic agriculture.

This trend is to be spotted in last week's sharp questioning of lead and zinc industry witnesses before the House Ways & Means Committee. Democratic congressmen led the assault in two ways: They wanted to know why, if the lead and zinc industries were in such dire straits, the administration was not seeking higher tariffs through the U. S. Tariff Commission or setting import quotas via the Office of Defense Mobilization, as is done in the case of oil.

Maybe That's the Republican Aim

Some observers are guessing the subsidy program is what the administration has wanted all along, but was afraid to push. Certainly Interior Department's "long range minerals program" is neither long range nor for all minerals. The program's emphasis on lead and zinc was practically an open invitation for Capitol Hill to make its own program. That way, if anything went wrong with it, the blame wouldn't fall onto the President or his party.

On the Senate side, Sen. Richard Neuberger (D., Oreg.) is one of the leaders for a straight subsidy program. He is starting to get more backing from his younger colleagues.

Other Industries Have Their Say

Not all of the witnesses testifying before the Ways & Means Committee want higher tariffs on lead and zinc. David Laine, secretary of the American Die Casting Institute, reminded congressmen that some domestic industries depend heavily on imports. He stated that zinc is already in a failing competitive position because of the inroads of stainless steel, aluminum, and plastics. To impose a sliding tariff scale on zinc imports would only aggravate the situation, he warned.

Another danger: Some congressmen charge that importers could manipulate the market to their own advantage under the tariff system. Since the tariff would be adjusted every three months to reflect changes in domestic prices, importers could easily anticipate tariff hikes and accumulate heavy stocks before they were put into effect. In this situation, consumers could hardly be expected to furnish to customers in February quotations on products scheduled for September delivery.

The Score on the Budget Cutters

Congressional Quarterly concludes: As of July 28, Congress had voted for economy only 38 per cent of the time. (On 50 roll call votes which presented clear cut opportunities to directly limit federal spending, congressmen backed economy 19 times.) The House did twice as well as the Senate: The House backed 13 of 27 economy moves; the Senate, six of 23.

On party lines, *Congressional Quarterly* says: The average Republican voted for 28 of the 50; the average Democrat for 15. Regionally, the most support for economy has come from western Republicans and southern Democrats in the Senate; from southern and midwestern Republicans and southern Democrats in the House.

Highest individual scores: Rep. Hamer H. Budge (R., Idaho) and Rep. Clare E. Hoffman (R., Mich.) in the House; Sen. John J. Williams (R., Del.), Sen. J. Allen Frear Jr. (R., Del.), and Sen. Strom Thurmond (D., S. C.) in the Senate.

Fast Tax Write-Offs Will End

Sen. Harry Byrd's (D., Va.) Finance Committee has approved a bill to kill fast tax write-offs for all expansions with the exception of "production or development facilities or new weapons for the Defense Department or Atomic Energy Commission."

Meanwhile, Office of Defense Mobilization is still holding out for the President's right to reinstate fast tax write-offs if an emergency arises. Write-offs are becoming so scarce ODM has stopped publishing its biweekly report on them.

With the civil rights debate over, look for Senator Byrd's bill to be one that will be gavelled through in the final minutes of the 85th Congress. Senate leaders are now looking forward to closing before the month ends.

More Fiscal Policy Hearings

This time Rep. Wilbur Mills' (D., Ark.) Fiscal Policy Subcommittee plans to hit the effect of federal expenditures on the nation's economy. About 80 economists will submit papers to the subcommittee in October, then join in roundtable discussions in November.

At the end of October, Rep. Richard Bolling's (D., Mo.) Economic Statistics Subcommittee plans to hear the findings of the National Accounts Review Committee. That group has been trying to determine the accuracy of government statistics.

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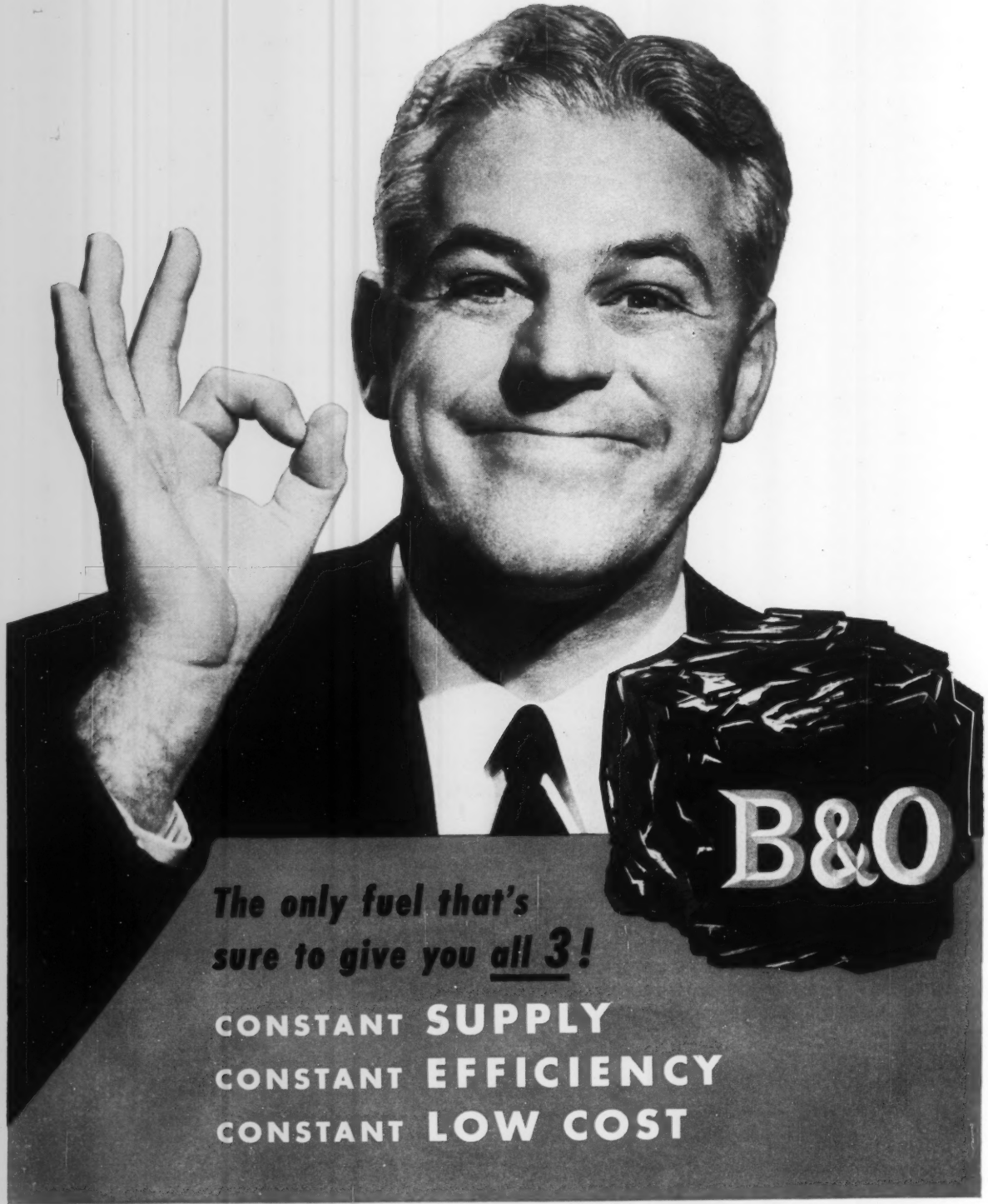

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Vice President Russell B. Robins tells how . . .

Layco Looks at Mergers

A DIVERSIFICATION program is paying off for L. A. Young Spring & Wire Co., Detroit.

Russell B. Robins, Layco vice president, recently told participants at the 16th annual Stamford, Conn., Business Conference, the guides he uses in seeking out likely merger candidates.

Mr. Robins should know what he's talking about. In the last four years, Layco has acquired seven companies or company assests and now makes wire products, seats and mattresses, power tail gates and loaders for trucks and trailers, dump truck bodies and hydraulic hoists, construction and road building equipment, lift trucks, electronic equipment and aircraft parts.

Why Diversify — Mr. Robins points out the four basic reasons for diversification: To provide for corporate growth, offset seasonal or cyclical fluctuations or a declining market or to take advantage of tax structures.

In Layco's case, it found its 50-year-old market for automotive seats, window moldings and similar wire products was tightening.

How To Start—"The first step was to look inside our own company. One byproduct of such internal analysis is to find how much you can improve at home," asserts Mr. Robins.

Next take time to think and study. Decide on what you want and put these needs down on paper.

"Don't try to do the job with your left hand. Assign a qualified executive working with a committee to handle this activity," Mr. Robins says.

What To Look for—From checking more than 500 firms, Mr. Robins has evolved a seven-point checklist for merger prospects:

- Products and people must fit into the parent company.
- Prospect should make identifiable products which can carry Layco's name.
- Prospect must earn at least 25 to 30 per cent net profits on invested capital before taxes.
- Annual volume must be at least $5 million.
- Company must be part of growth potential.
- It should be in metalworking.
- It must have enthusiastic, young minded management people who want to stay on.

How To Find—In tracking down companies, Mr. Robins contacts brokers, bankers and consultants.

A five-man board of inquiry must unanimously approve final selections prior to negotiations.

After the Wedding—"The biggest job in a physical merger is merging people. It's important to exercise adequate home office control without impeding local management and operations," Mr. Robins emphasizes.

Communications are stressed. Internal changes are made gradually. The marketing setup usually gets a good overhauling.

Payoff — Here are its acquisitions:

March, 1954: Daybrook Hydraulic Corp., Bowling Green and Upper Sandusky, Ohio.

July, 1955: Ottawa Steel Inc., Ottawa, Kans.

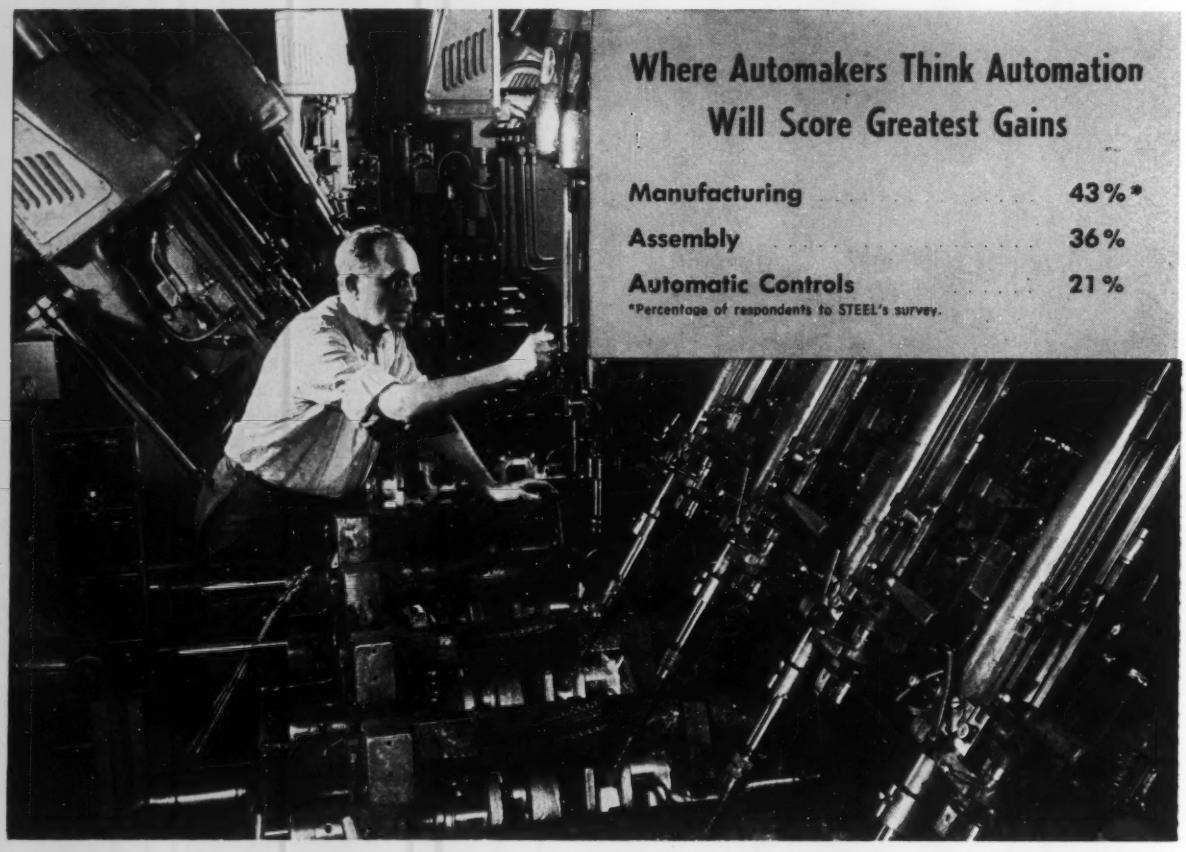
December, 1955: Tracto-Lift Co., Kansas City, Mo.

March, 1956: Woodside Power Loader Division of Woodside Industries, Milwaukee.

October, 1956: Gonset Co. Inc., Burbank, Calif.

November, 1956: Extruded Hinge Co., Ypsilanti, Mich.

January, 1957: Manufacturing assets for aluminum honeycomb from Flexo Mfg. Co. Inc., Los Angeles.



Where Automakers Think Automation Will Score Greatest Gains

Manufacturing	43%*
Assembly	36%
Automatic Controls	21%

*Percentage of respondents to STEEL's survey.

Ford Motor Co.

Auto Industry Weighs Automation Costs

AUTOMATION is increasing in the automotive industry, but car firms aren't going hog wild on super duper installations which won't bring in a high return on the investment.

That's the conclusion you can draw from a STEEL survey initiated when industry talk suggested that automation had reached its limit in raising productivity and that new installations were headed for a decline. Participating in the survey were top auto executives, automotive suppliers, material handling firms and builders of automated equipment.

Increase Predicted—Two-thirds of the survey respondents say the dollar volume of automated equipment will increase during 1958 and 1959. Of these, 43 per cent believe the greatest increase will come in basic manufacturing processes; 36 per cent feel it will show mostly in assembly categories; and 21 per cent predict automatic controls will have the largest growth.

Here is a typical response of the one-third who see no increase in sales. Says John F. Anderson, manager of production engineering at Chrysler Corp.'s engine division: "We've seen a slowing down of automation in areas of assembly because the cost savings do not justify the initial investment."

John Q. Holmes, director of production engineering for the process development section of GM's technical center, says there's no slowdown; manufacturers are just being more conservative. He adds: "When we spend large sums for automatic equipment, it must be designed so engineering changes in future models won't make it obsolete."

Builders' Outlook—R. C. Becker, sales manager, Wilson Automation Co., Detroit, speaks for the equipment builders when he says: "Aside from some retrenching to reduce capital equipment costs momentarily, I still find the same enthusiastic interest in automated equipment."

The days of automating for automation's sake seem to be over. Lloyd F. Christensen, superintendent of production engineering at GM's AC Spark Plug Division,

Flint, Mich., explains: "The trouble is that engineers got so carried away with thinking up fancy ways to mechanize operations that they forgot all this machinery costs money." One GM division, for example, spent $1 million on a straight line automated operation. The whole setup had to be changed the next year to produce a new model, and the division recovered only 20 per cent of its initial investment.

Harder Agrees — Del Harder, Ford Motor Co.'s executive vice president, who coined the term "automation," has warned for years that the technique can be applied only to jobs which justify the added expense. He believes automation's greatest gains will be made in basic manufacturing. Assembly is next on his list.

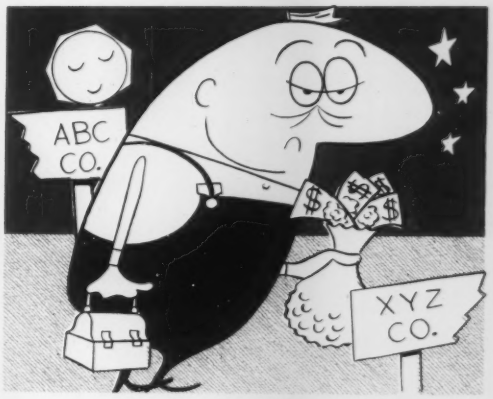
Although Ford's concept of designing automated equipment in standardized units for easy integration has won much support, GM is critical of the method. Says Mr. Holmes: "We think working with standardized units would limit production engineers." (GM eschews the term "automation," speaks instead of "mechanized material handling.")

Standardized or not, the outlook is for more subassembly automated units that can often be amortized in a year, according to Marvin Anderson, president, Michigan Tool Co., Detroit.

O. K. Dieckman, president, Airway Products Inc., Pontiac, Mich., offers these examples:

- A car chassis and frame storage and assembly conveyor setup just completed at Chrysler's Newark, Del., assembly plant.
- An automatic tire and wheel assembly line, also at Newark.
- An automated connecting rod manufacturing and assembly line at Chrysler's Trenton, Mich., engine plant.

Summary — That's the pattern automotive automation seems to be taking. Perhaps it's best summed up by E. W. Franz, secretary-treasurer, May-Fran Engineering Inc., Cleveland: "The field of partial automation will continue to grow more rapidly, particularly in high production operations which will justify the investment when amortized over a period of one or two years."



Automation cuts work week, but workers work in 'leisure' as . . .

Double Employment Gains

MOONLIGHTING, the practice of holding two jobs at once, is on the rise. It's an outgrowth of the short work week and of automation, says the National Industrial Conference Board.

For several million moonlighters the prime motivation is money. But aiding and abetting the practice is the five-day, 35 to 40-hour work week and the increasing mechanization of industry. Workers now have the leisure and vigor to hold two jobs. What's more, today's tight labor market offers the highly skilled numerous job opportunities with high pay and generous benefits.

Management's View — To find out how management feels about moonlighting, NICB questioned 25 representative companies. Five call it a "fairly serious" problem; five say it's a "minor headache"; and 15 describe its effects as "not serious."

Three executives estimate 25 per cent of their production workers have second jobs. Two companies report 20 per cent, and two others 10 per cent. While one firm says it has no moonlighters, another guesses that half of its highly skilled workers have double employment. Among employees working a 40-hour week, moonlighting was put at 8 per cent; for those working less than 40 hours, the estimate was 14 per cent.

While most companies object to double employment or attempt to forbid it entirely, they don't always know when and where it exists. Some firms are inclined to tolerate or ignore the practice so long as it doesn't get out of hand. A few express a willingness to hire men even when it's known that they are employed elsewhere.

Bad Effects — Management frowns on double employment for these reasons: 1. The man who works day and night may be a frequent absentee. 2. His work may suffer both in quality and in quantity. 3. He may cause trouble by shirking his part of the job and asking others to cover up for him. 4. He may become involved in accidents.

NICB suggests these measures for control of moonlighting:

- Establish a company policy on double employment.
- Explain your policy to job applicants; include a statement in application blanks and in handbooks for employees.
- Co-operate with other employers in the area and with union leaders.
- Watch for early signs of moonlighting in individual cases.

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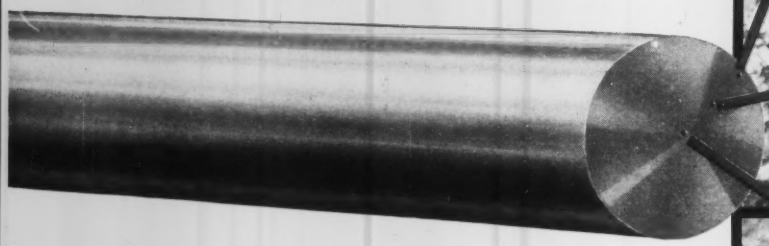

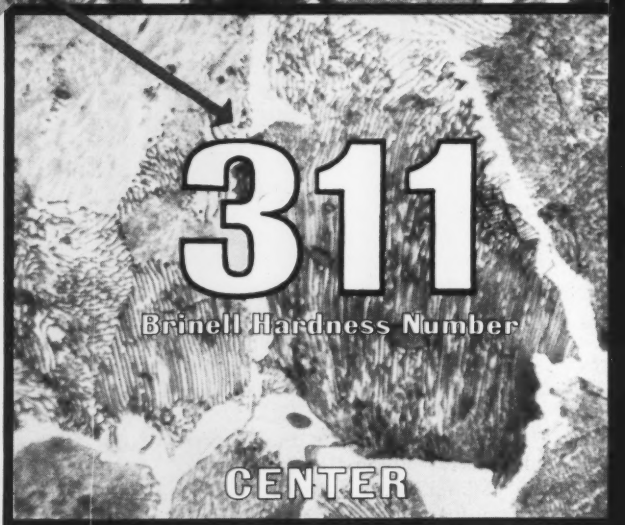

1⅞" round FATIGUE-PROOF. Magnification: 750X

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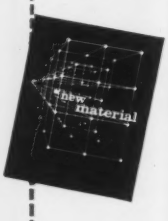

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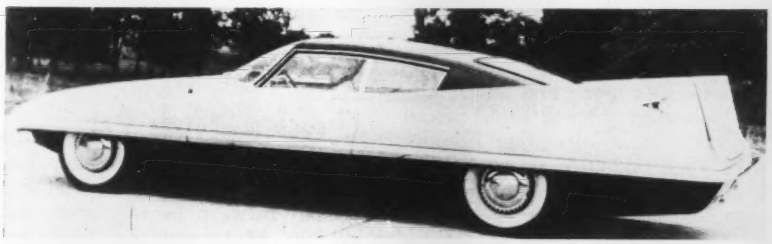

Another experiment, Chrysler's Dart, hint . . .

Style Trends for '58 Cars

NEW MODELS are ready to debut — none too soon for General Motors.

Mr. Big in the auto world hopes to recoup 1957 losses with completely changed Pontiacs and Chevys, drastically restyled Oldsmobiles and Buicks.

The 1958 cars will appear at the usual times. Ford's newcomer, Edsel, is the early bird. It will be out a week after Labor Day. Lincoln will follow shortly.

Trends — Air suspension, unit body construction and sports cars are the big talk for '58.

Almost all lines except Studebaker-Packard and Chrysler Corp. will offer air suspension as a standard or optional item. Packard will reinstate torsion bar suspension, and Chrysler will stick with its Torsion-Aire system.

The forward look firm does have a combination hydraulic air and torsion suspension unit it can put in as a running change if the public demands it.

Body builders long have said Lincoln will move to unit body. Ford also will make its four seater Thunderbird in unitized form.

Several makes will attempt to cash in on the sports car market with sports-type cars similar to Studebaker's Hawk.

Materials—More aluminum will be used in grilles, interior trim and for engine and transmission components. The average 1958 car equipped with automatic transmission, power brakes and steering will carry upward of 62 lb of aluminum compared with 51 lb last year.

New Pitch — Since the horsepower race officially has ended, automakers will be talking in terms of cubic inches of displacement and foot-pounds of torque. All this means is horsepowers are higher but unheralded.

Here's what's happening in '58:

- Pontiac, Chevy and Lincoln — complete engineering and styling changes.
- Olds, Buick and Ford—extensive facelifts.
- Chrysler Corp. and Cadillac—relatively minor styling changes.
- AMC will add a short wheelbase model to its line.
- S-P will concentrate on the Hawk and emphasize the economy Scotsman line.

Tooling costs have been higher than expected for what should be a facelift year. One reason is the high cost of unit body tooling which starts from scratch. Another is the unexpected changes Buick and Olds put through in a crash program. In any case, 1958 model tooling is pegged at close to $900 million; almost as much as was spent for 1957 cars.

Here are more details, model by model.

GM Recovers

Pontiac—Is due in early November. Pontiac will be using both GM's A and B body shells (see STEEL, Apr. 29, p. 136).

This may be the forerunner of a switch to only two body shells for Fisher Body cars.

The 1958 Pontiac will be at least 3 in. lower in height. Quarter panels are sculptured and scooped out somewhat like the Corvette. The fenders have a slight fin appearance.

There's a stepdown in the roof line and taillights are placed on spearlike projections. Pontiac will retain the same basic engine.

The division is expected to offer its Bonneville fuel injection convertible as a sports car item. All models will offer optional air suspension and fuel injection.

Chevrolet—Premier is scheduled

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for end of October or early November. Big news about Chevy is its Impala series which will head up the line.

The Impala shares 1958 Chevy styling and is aimed at the sports car crowd. It will compete with the Hawk and T-Bird, but comes closest to Ford's Fairlane in concept and price.

All Chevy lines will be about 57 in. high. Sculptured quarter panels flow deep into the deck area. Triple taillights are set horizontally into the quarter panels down low.

The grille resembles this year's styling, but it's only about 7 in. high and has a finer latticework appearance.

Chevy also has a V-8 engine available either for cars or trucks. Air suspension, fuel injection and dual headlights will be offered.

Buick—Not due until mid-November or later. Engineering changes are relatively minor because Buick made one of the best engineering switches in '57.

It's triple turbine transmission finally will appear after being shelved for engineering changes last year. Fuel injection and air suspension are offered.

To disappear will be the parting lines running from rear deck over the roof. The one piece rear window will be standard across the board.

To recover the massiveness that spells luxury, Buick has restyled its grille in heavy horizontal bars somewhat resembling the 1957 Olds in shape.

Oblong rear lights set in heavy chrome frames also are set in a vertical position. Quarter panels give a slight finlike appearance to the rear fenders, but the Buick box look remains. Another distinctive Buick touch is gone—the "portholes" along the front fenders.

Oldsmobile — Will appear about the same time as Buick. The same general styling changes apply to Olds and to Buick. Grilles won't be much different, however, but the parting lines are gone.

Air suspension will be available on both Buick and Olds. The divisions may make it standard on top lines later this year.

Cadillac—Should bow in October, with few changes. Air suspension will be standard. The car may be 1 in. lower and will make some improvements in its braking system.

The expensive El Dorado brougham may not last through 1958.

Ford Refurbishes

Lincoln—Ford's luxury car will be announced shortly after mid-September. The 1958 models already are rolling off the Wixom, Mich., assembly line. Unitized bodies are the biggest change (STEEL, Dec. 17, p. 67).

Quarter panels will flow all the way to the front of the car in a sweep. The front end will remain about the same although dual headlight units will be relocated. Lincoln will have air suspension. The car is 5 in. longer (229 in.) than last year.

Ford—The bread and butter line has been getting a high priced facelift to make sure it can keep up with Chevy next year.

Although the basic silhouette is unchanged, all quarter panels and roofs are new. Bumpers, grilles and trim have been redesigned. The big round taillight has been replaced by two horizontal oval lights. A redesigned 352 cu-in. engine will be offered. Translated this equals about 280 hp. Air springs will be optional. Fuel injection will be available, but not touted.

Mercury—Mid-October introduction. The car has been little changed, stylewise. It will have optional air springs and a larger engine. Another line of cars has been added to the Mercury group.

Edsel—There's little to add to the long talked about addition to Ford's lineup. The Edsel will fit between Ford and Mercury. It has scooped out rear quarter panels, a reverse angle on the rear window and a vertical oval in the center of the grille.

Air suspension is optional. A smooth transmission is actuated by pushbuttons centered in the steering wheel hub. Dual headlights are standard.

U.S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,619
May	531,365	471,675
June	500,271	430,373
6 Mo. Total	3,372,888	3,192,601
July		448,876
August		402,575
September		190,726
October		389,061
November		581,803
December		597,226
Total		5,802,808

Week Ended	1957	1956
July 6	73,682	68,110
July 13	111,943	112,361
July 20	124,894	113,416
July 27	119,857	120,416
Aug. 3	119,009†	124,416
Aug. 10	115,500*	111,157

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Chrysler Stands Pat

Chrysler Corp. is making few changes on its cars, which will appear between mid-October and the end of November. The company feels its styling will hold up with the industry.

Dodge and De Soto have an interchangeable V-8 engine, with greater cubic displacement, and horsepower over the 320 mark.

Plymouth plans to push its six-cylinder engine and has smoothed off the hump in its rear fins. Grille styles have been narrowed and made more massive.

AMC, S-P Hit Fringes

American Motors and Studebaker-Packard Corps. are aiming at the small market segments the Big Three don't bother with (STEEL, July 29, p. 85).

AMC will add a fifth car to its model lineup. The car will be a restyled version of the 1954 Rambler and will sport a 100-in. wheelbase. Nash and Hudson will be built on the Rambler body shell.

S-P has continued the trend to less chrome on all models. Packard will bring out a Hawk model and Studebaker Division hopes to exploit further its Scotsman economy cars. The company is preparing to market the Mercedes-Benz cars later this year.

Both AMC and S-P plan to introduce their lines in October.

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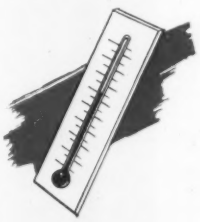

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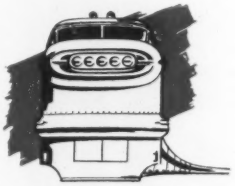

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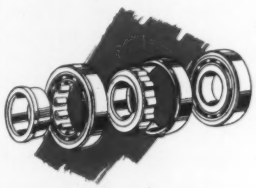

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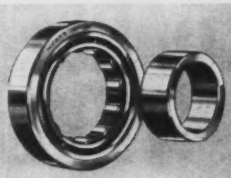

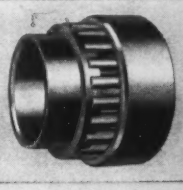

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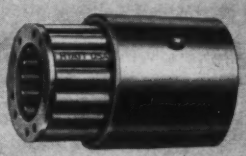

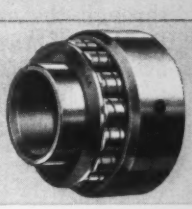

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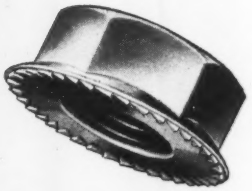

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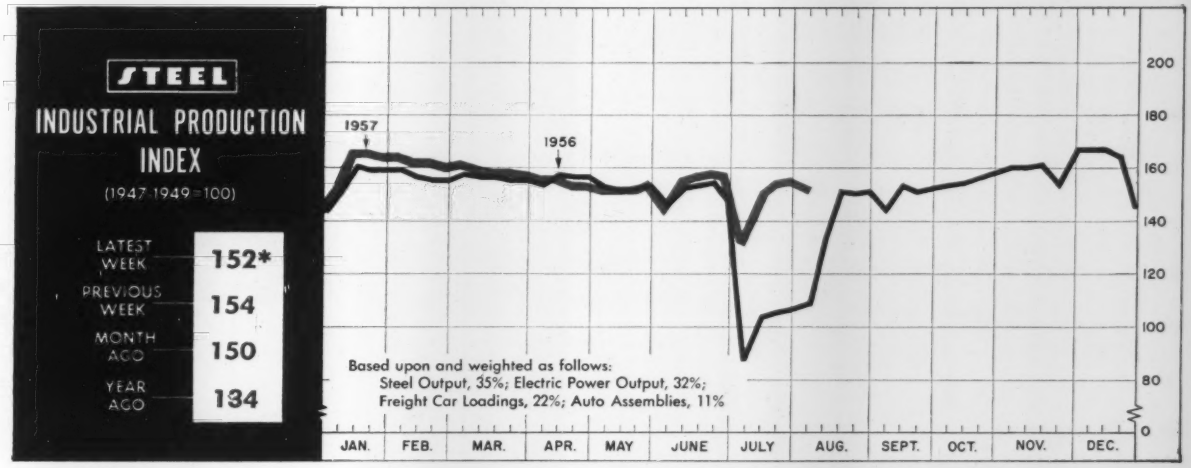
Assembling heavy duty equipment with RB&W high strength bolts in the first place can avoid such problems and create more satisfaction with the product.

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY



*Week ended Aug. 3.

Metalworking Employment May Rise

METALWORKING employment (see chart on p. 92), lagging behind the country's strong overall demand for workers, may have reached the turning point.

Signs—This is suggested by several things: 1. The automotive industry plans to build 520,000 units in August—4.9 per cent more than the July figure and 29.2 per cent above that of August, 1956. 2. Production of transportation equipment in Portland, Maine, and electrical equipment and supplies in Terre Haute, Ind., are increasing. 3. Heavy construction contracts hit $401 million the last week of July for the third consecutive weekly increase. 4. Fourth quarter steel production is expected to average above 87 per cent of capacity and push the year's output above 1955's record 117 million tons.

A Labor Department survey anticipates fall employment increases in construction, electrical machinery and primary and fabricated metals.

The first seven months of this year found highway contracts at $1.9 billion, 31 per cent higher than in the corresponding period in 1956. All heavy construction contracts totaled $11.4 billion for this period, 15 per cent under 1956's record peak, but slightly higher than the 1955 level.

Mass housing contracts by private interests reached $63.3 million for the final week in July. Commercial building contracts were $46.2 million for the same period while state and municipal governments awarded $163.7 million in contracts.

Boost for Homes—Reduction of down payments and the increase of the interest rate on FHA-financed homes may slightly stimulate employment in house construction (see p. 77). Down payments of 3 per cent on the first $10,000 instead of 5 per cent on the

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,100[1]	2,092	1,415
Electric Power Distributed (million kw-hr)	12,200[1]	12,243	11,295
Bituminous Coal Output (1000 tons)	10,123[1]	10,125	9,090
Petroleum Production (daily avg—1000 bbl)	7,100[1]	7,101	7,065
Construction Volume (*ENR*—millions)	$407.0	$401.0	$309.4
Auto, Truck Output, U. S., Canada (*Ward's*)	140,157[1]	150,606	140,994
TRADE			
Freight Car Loadings (1000 cars)	715[1]	736	640
Business Failures (Dun & Bradstreet)	228	266	274
Currency in Circulation (millions)[3]	$30,909	$30,999	$30,575
Dept. Store Sales (changes from year ago)[3]	+4%	+5%	+1%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,500	$20,873	$20,618
Federal Gross Debt (billions)	$272.7	$272.8	$272.6
Bond Volume, NYSE (millions)	$16,095	$15,778	$20,405
Stocks Sales, NYSE (thousands of shares)	9,030	8,873	11,657
Loans and Investments (billions)[4]	$87.0	$86.2	$84.5
U. S. Govt. Obligations Held (billions)[4]	$25.6	$25.2	$26.0
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	225.71
STEEL's Nonferrous Metal Price Index[6]	216.8	216.6	261.7
All Commodities[7]	118.0	118.0	115.0
Commodities Other Than Farm & Foods[7]	125.4	125.4	120.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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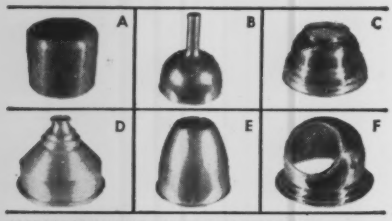
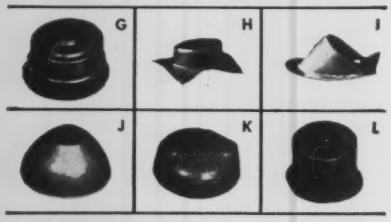


METAL SPINNING AND SPINFORMING:
Typical items: **A—Aircraft detail; B—Handle lamp; C—Lamp shade; D—Lamp base; E—Electronic cover; F—Compass cover.**



HYDROFORMING:
Typical items: **G—Appliance cover; H—Jet engine detail; I—Aircraft detail; J—Jet engine detail; K—Cleaner cover; L—Motor housing.**

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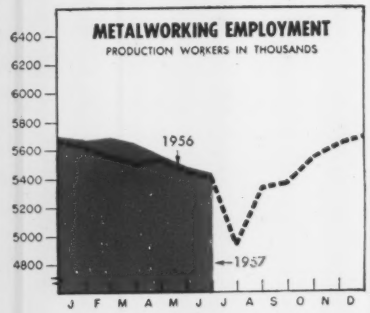
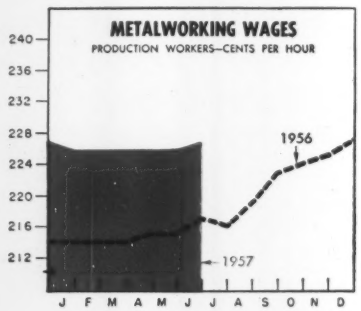
THE BUSINESS TREND



1956	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
June	1,118	870	1,278	866	1,269
July	743	825	1,254	854	1,250
Aug.	1,091	864	1,257	878	1,235
Sept.	1,126	885	1,262	891	1,205
Oct.	1,132	911	1,264	914	1,319
Nov.	1,132	911	1,273	918	1,402
Dec.	1,133	909	1,289	907	1,439
1957					
Jan.	1,130	906	1,299	892	1,440
Feb.	1,124	903	1,294	877	1,482
Mar.	1,112	898	1,291	869	1,474
Apr.	1,101	889	1,277	853	1,446
May*	1,090	883	1,255	845	1,431
June*	1,091	882	1,233	846	1,413

*Preliminary.
U. S. Bureau of Labor Statistics.



1956	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
June	234	206	219	197	229
July	227	206	220	198	229
Aug.	236	207	221	199	232
Sept.	241	211	225	201	236
Oct.	242	213	225	203	238
Nov.	244	213	225	204	239
Dec.	245	215	226	205	243
1957					
Jan.	247	213	226	206	237
Feb.	245	213	227	206	238
Mar.	246	214	228	206	238
Apr.	246	214	228	206	238
May*	246	215	228	205	237
June*	247	217	229	206	239

*Preliminary.
U. S. Bureau of Labor Statistics

Charts copyright, 1957, STEEL.

first $9000 would make it easier on the home buyer.

Riding a Boom

A booming area in business is the electronics industry. Evidence of this is the performance of Amphenol Electronics Corp., Chicago. It had a net income in the first half of this year 51 per cent greater than that in the corresponding period in 1956. The second half is expected to top the first half's $944,255, Vice President John L. Woods says.

Total sales for 1957 should reach $33 million, Mr. Woods anticipates, against $27.3 million for 1956.

Sales and Orders Slip

June manufacturers' sales and new orders were down slightly from May, Office of Business Economics, Department of Commerce reports.

Manufacturers' sales totaled $28.5 billion in June, down 1 per cent from May. Fabricated metal and transportation equipment sales showed larger than average declines.

Manufacturers received $27.6 billion in new orders in June, 4 per cent under the May figure.

Manufacturers' book value of inventories was $54.2 billion at the end of the first half of 1957, about $4 billion higher than at the same time in 1956.

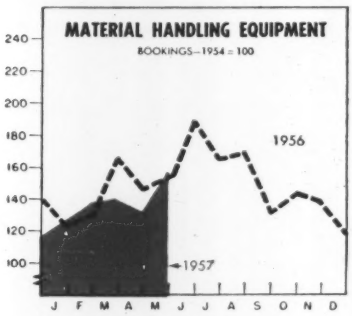
At the end of the first six months of 1957, unfilled orders totaled $60 billion, the same as they did in June, 1956.

Imports Decline

The easing in business extended to foreign trade, too. All imports into the U. S. dropped slightly in May from the April level, the Department of Commerce reports. The dollar value of April imports was $1.1 billion and May fell $15 million below that.

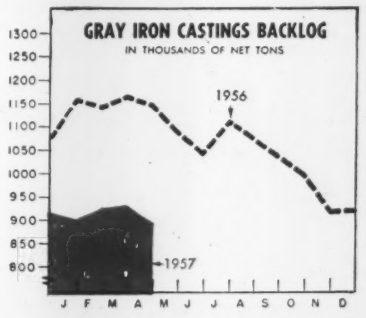
PAs See Prices Rise

The July business survey of the Purchasing Agents Association, Chicago, reveals 54 per cent of reporting members say selling prices are being raised to meet higher costs. The survey finds business activity going into the second half at a relatively high level.



	1957	1956	1955	1954
Jan.	126.34	122.43	97.00	93.56
Feb.	139.29	129.56	98.71	96.45
Mar.	140.76	166.14	149.16	115.55
Apr.	132.67	145.20	109.52	122.76
May	157.95	155.53	110.50	98.54
June	.....	189.13	139.00	112.42
July	.....	165.50	111.76	91.68
Aug.	.....	168.70	106.20	94.06
Sept.	.....	130.35	136.80	88.43
Oct.	.....	143.38	123.52	95.41
Nov.	.....	138.50	118.09	88.66
Dec.	.....	117.76	139.85	102.49
Avg.	.....	147.68	120.01	100.00

Material Handling Institute Inc.



	Shipments 1957	Shipments 1956	Unfilled Orders* 1957	Unfilled Orders* 1956
Jan.	1,213	1,250	905	1,158
Feb.	1,103	1,215	931	1,141
Mar.	1,133	1,255	935	1,163
Apr.	1,120	1,218	899	1,145
May	....	1,236	....	1,086
June	....	1,152	....	1,041
July	....	763	....	1,109
Aug.	....	1,103	....	1,074
Sept.	....	1,110	....	1,037
Oct.	....	1,275	....	996
Nov.	....	1,176	....	917
Dec.	....	1,109	....	920
Total	....	13,862		

*For sale. U. S. Bureau of the Census.

Operating levels show wide variation between industries, it says, with some prices moving up and others restrained by competition. The dampening effect of the squeeze on profits is causing close control of inventories. Commitments are being made only for known requirements on short term deliveries.

Railroad Costs Climb

The nation's Class I railroads had operating revenues of $5.2 billion the first half of 1957, less than 0.1 per cent decrease from the same period last year, while operating expenses in 1957 rose 1.8 per cent over the corresponding period in 1956.

Net income for the half year period, after interest and rentals, was estimated by the Association of American Railroads at $345 million compared with $404 million during the corresponding period of 1956.

The rate of return on investment averaged 3.69 per cent for the 12 months ended in June, 1957, compared with 4.13 per cent for the 12 months ended in June of last year.

Coal Production Steady

One of the railroads' main revenue items, coal, is being produced at about the same rate as last year. The National Coal Association reports 279.9 million tons were produced during the first seven months of this year compared with 280.6 million tons for the same period in 1956.

Trends Fore and Aft

• Business loans at leading New York banks at the end of July amounted to $11.6 billion, $1.5 billion more than for the same period last year. Business loans expanded $145 million the first seven months this year compared with $886 million for the same period in 1956.

• The Federal Reserve Board reports that consumer installment debt rose $443 million in July and topped the previous record monthly rise in May of $369 million. At the end of June, total consumer installment debt was $32.3 billion against $30 billion a year ago.

• The Ford Motor Co. will spend $185 million in changing over to its 1958 models.

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With the installation of the first Accu-Ray Nuclear gauge ever employed in the non-ferrous industry, Somers is able to control the thickness of thinstrip to the hundred-thousandth even on production runs.

This is typical of the modern equipment and the careful quality control that enables Somers Brass to produce the one thinstrip job in ten that must meet exacting standards with absolute uniformity.

If you are now using or anticipate the need for thin gauge brass, nickel, copper and alloys with extremely close tolerances write for the Confidential Data Blank. There is no cost or obligation.

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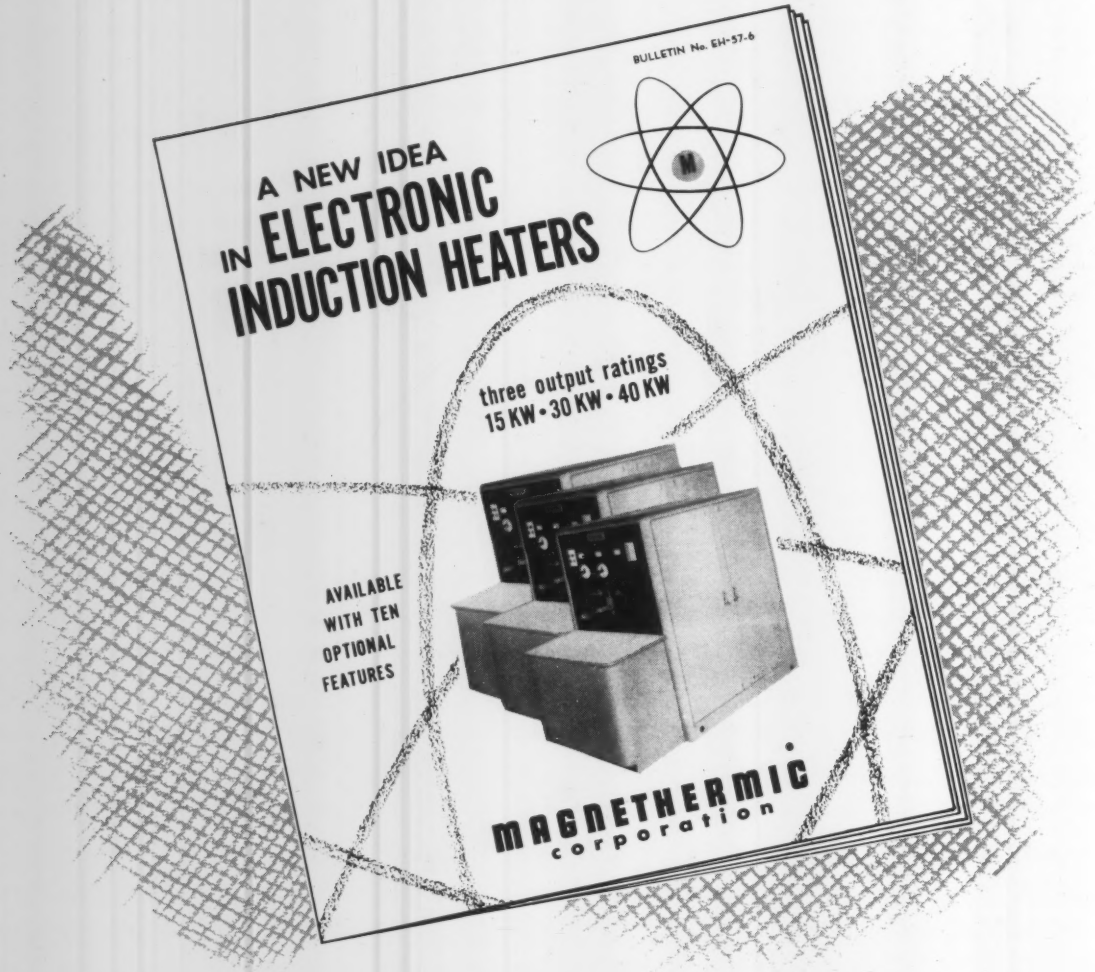


New Approach to Electronic Induction Heaters

For the first time, an electronic induction heater can be pinpointed to specific conditions or operation —literally a custom design at reasonable cost.

No two induction heating processes are the same. For optimum performance, each induction heater should be hand tailored to the job. The Magnethermic plan of adding optional features to a standard heater results in a custom design at low cost. Magnethermic's "building block" principle for electronic induction heaters provides the flexibility needed for low unit cost.

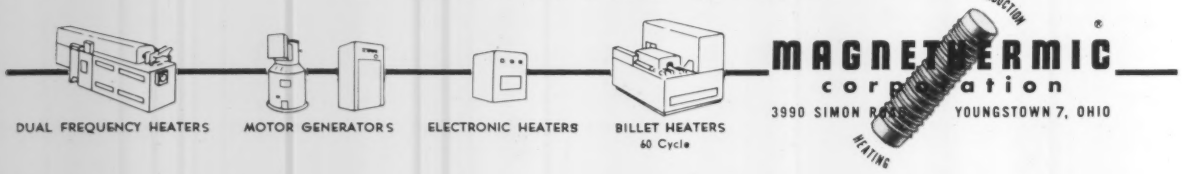
Here are a few of the optional features which can be added to the standard heater:

- **Built-in Output Transformer**
- **Stepless Thyraton Power Control**
- **Built-in Water Cooling System**
- **Dust-proof Cabinet and Air Cooling System**

All ten optional features and the standard heater are detailed in this new bulletin, available upon request. The bulletin contains ratings, specifications, and such useful data as a frequency selector chart, surface hardening table.

Heaters available from stock in three ratings— 15 KW, 30 KW, 40 KW output.

Address your electronic induction heater inquiry to Magnethermic, Youngstown, Ohio.
New Bulletin EH-57-6 available upon request.



WALTER MURPHY
Transue & Williams mfg.-dir.

DONALD H. SPICER
Ferry Cap sales v. p.

RICHARD A. POWLEY
Pesco Products president

ELMER L. MILLER
Continental Boiler sales mgr.

Walter Murphy was made director of manufacturing, forging division, **Transue & Williams Steel Forging Corp.**, Alliance, O. He was a vice president of Martin-Perry Co., Toledo, O.

Donald H. Spicer joined **Ferry Cap & Set Screw Co.**, Cleveland, as vice president-industrial sales. He previously served as sales vice president for Morse Chain Co., American Bosch Co. and as president of World Bestos Corp.

Charles B. Morgan, former superintendent of molding and assistant manager of production at **Synthane Corp.**, Oaks, Pa., was named general manager of production to succeed **Duane E. Roland,** retired.

Nelson Havill was made general sales manager, **Potter & Brumfield Inc.**, Princeton, Ind., a subsidiary of American Machine & Foundry Co. Formerly field sales manager, he succeeds **Dale V. Cropsey,** resigned.

Jack Warshauer, executive vice president-general manager, Mercast Mfg. Corp., La Verne, Calif., was elected a vice president of its parent company, **Mercast Corp.**, New York, a subsidiary of Atlas Corp.

Avery C. Adams, president and chief operating officer of **Jones & Laughlin Steel Corp.**, Pittsburgh, will serve as chief executive officer, effective Oct. 1. **Adm. Ben Moreell** will retain functions of chairman of the board and chairman of the executive committee.

Richard A. Powley was elected president, **Pesco Products Division,** Borg-Warner Corp., in Bedford, O. He was assistant general manager at Ford Motor Co.'s Chicago aircraft engine division.

Charles A. Cooper was elected vice president, **Rockwell Spring & Axle Co.**, Coraopolis, Pa. He was manager of the firm's Bossert-Utica plant in Utica, N. Y.

Elmer B. Ott was elected president, **Ray-O-Vac Co.**, Madison, Wis. He was senior vice president-administration and finance. **Donald W. Tyrrell,** former president and chairman, continues as chairman. **Harry J. Mason** was elected vice president-research and development. **J. A. McInay,** in addition to serving as vice president-sales, will direct the Willson Products Division at Reading, Pa.

Hal P. Kibber was elected executive vice president, **Gate City Steel Inc.**, Denver. He was assistant vice president-sales in Chicago for the supply division of U.S. Steel Corp.

Ralph B. Marstens was elected chairman of **Carleton Machinery Corp.**, San Diego, Calif.

W. H. Meyer was made technical director of **Shultz Steel Co.**, South Gate, Calif. **M. V. Mills** was made regional sales director, assigned the midwestern aircraft industries. Mr. Meyer was chief metallurgist for Green River Steel Corp. Mr. Mills served Green River as general superintendent.

Elmer L. Miller was made sales manager, **Continental Boiler & Sheet Iron Works,** St. Louis.

Duane S. Seavey was made general sales manager, **Ralston Steel Corp.**, Skokie, Ill. He was sales manager for Diamond Steel Corp.

Howard E. Anderson Jr. was made district manager at Cleveland for **Minnesota Rubber & Gasket Co.**

Clemens A. Tarter was made assistant superintendent at **Kaiser Steel Corp.'s** tin mill, Fontana, Calif. Also named assistant superintendent: **A. G. Trott,** hot dip and finishing departments; **Paul E. Nelson,** cold reduction department.

E. Howard Johnston, former works manager, was elected vice president - manufacturing, **Standard Forgings Corp.**, Chicago.

Milton M. Kanter was appointed assistant to the vice president and secretary of **Ford Instrument Co.**, Long Island City, N. Y. He was with David Bogen Co.

Virgil M. Exner, director of styling, **Chrysler Corp.**, Detroit, was elected a vice president.

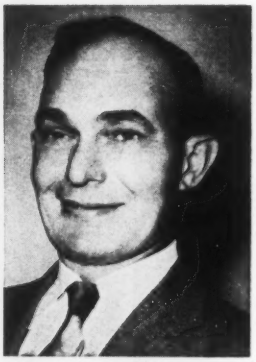
L. G. Johnson, former vice president of Beacon Supply Co., was named to the Los Angeles sales office of **Cleveland Cap Screw Co.**, Cleveland.

William B. McWhirter was made general manager, supplies division, **International Business Machines**

JOHN P. KELLY
Gould gen. sales mgr.

C. J. HEYDA
American Can plant mgr.

FRANK I. GOODRICH
Eaton Mfg. administration



JAMES P. BEYSER
Ingalls Iron Wks. plant mgr.

Corp., New York. **Robert L. Adams** was made purchasing agent of supply items.

John P. Kelly was made general sales manager, industrial division, **Gould-National Batteries Inc.** Previously Detroit regional manager, he is now at Trenton, N. J.

C. J. Heyda was made manager of **American Can Co.'s** Hammond, Ind., coil plant, the company's first plant devoted entirely to coil processing operations. He was assistant plant manager at the firm's Maywood Sanitary plant.

Edward S. Falsetti was named head of mechanical services in the technical services group of **Electro Metallurgical Co.'s** Metals Research Laboratories, Niagara Falls, N. Y.

At **Republic Steel Corp.'s** Berger Division, Canton, O., **Frank Peterson** was made assistant division manager; **John A. Fellows,** assistant to the division manager.

Paul J. Every, general sales manager, **Cummins Engine Co. Inc.,** Columbus, Ind., was made managing director of the company's subsidiary in Shotts, Lanarkshire, Scotland. He succeeds **D. J. Cummins,** who returns to devote full time to duties as vice president-engineering.

International Resistance Co. named **Ralph Dinsmore** manager; **Evon Wells,** assistant manager of its Philadelphia sales office.

Larry Livermont was made assistant to the president of **Richmont Inc.,** Monrovia, Calif. He was works manager.

Frank I. Goodrich was elected vice president-administrative of **Eaton Mfg. Co.,** Cleveland. He succeeds **F. H. Mott,** retired. Mr. Goodrich was staff assistant to Mr. Mott, a position to which he was appointed several months ago. For years he was general manager of Eaton's Spring Division, Detroit.

W. Kenneth Dorman was made manager, slag products, **United States Steel Corp.,** Pittsburgh. He succeeds the late **R. K. Plumb.**

H. Lindley Hosford was made district manager at Philadelphia for **Okonite Co.,** succeeding **J. G. Wicks,** now regional sales manager. Mr. Hosford served as manager of the Rochester office and more recently was in charge of government orders at company headquarters in Passaic, N. J.

J. Wendell Coombs joined **General Metals Corp.,** San Francisco, as vice president of administration. He was an official of Transamerica Corp., holding firm for General Metals.

David P. Hall was made assistant to the director of metallurgical sales, **Island Creek Coal Sales Co.,** Huntington, W. Va. He is in Pittsburgh. He was assistant manager of the New York division.

Charles W. Ostrander was made technical director of **Allied Research Products Inc.,** Baltimore.

H. W. Cory was named assistant manager; **W. F. Eagan,** engineer in charge of the control department of the general product division, **Allis-Chalmers Mfg. Co.,** Milwaukee.

James P. Beyser was made general manager of the Verona, Pa., plant of **Ingalls Iron Works Co.** For 30 years he was vice president-general manager of Buffalo Forge & Machine Co., Buffalo, and continued in that capacity after it was merged with Blaw-Knox Co. **John C. Agey** was made assistant manager at the Verona plant.

A. E. Somerville was made manager of construction operations at **Arthur G. McKee & Co.,** Cleveland. He succeeds the late **James H. Sharpe** with whom he had worked as assistant construction manager. Now in Pittsburgh, he will move to Cleveland in the near future. **R. G. Widman** was made assistant construction manager.

Eclipse Fuel Engineering Co., Rockford, Ill., created four operating divisions and named as vice presidents-managers: **Everett E. Magnuson,** steam boiler and high temperature heat transfer division; **Arthur D. Wilcox,** industrial combustion division; **F. F. Marlowe,** gas service products division; and **Richard E. Hayden,** manager, industrial furnaces.

Emhart Mfg. Co. named **Robert Clark** manager of its Hartford-Empire Co. Division's plant 3 and its Windsor street plant, Hartford, Conn. (former headquarters of the Henry & Wright Division, recently sold to Koehring Co.). **Neil Van Deusen** succeeds Mr. Clark as plant manager, V & O Press Co., division at Hudson, N. Y.

Brooks McCormick was elected an executive vice president, **International Harvester Co.,** Chicago, to succeed **Christian E. Jarchow,** re-

Bearings, Inc. customers . . . are the best "price buyers" in business!

Take this steel mill as a good example. The Superintendent of Mechanical Maintenance and the Master Mechanic shown above talking to our sales representative, buy many bearings at competitive prices from Bearings, Inc. every year. By using our services to their fullest extent . . . By accepting the knowledge of Bearings, Inc. engineers, they get a "value added" that makes their bearing purchases far less expensive than can be supplied by most other distributors.

Here are some of the services Bearings, Inc. is continually performing for this mill:

- An original survey, made before a new rod mill went into operation, catalogued each of the 8,000 bearings in the mill as well as oil seals and bronze bushings. A weekly recap keeps the inventory up to date.
- Reducing duplication and elimination of bearings no longer needed through periodic checks.
- Suggesting methods which have improved quality of product, lessened maintenance costs and lengthened machinery life.
- Conducting educational meetings among plant workers, showing them how they may cut maintenance costs.
- Re-wrapping stock to keep out dirt.
- Availability for consultation about plant problems. A telephone call will bring the Bearings, Inc. man in a hurry if the problem cannot wait until his regular call.
- Helping set up a preventive maintenance system enabling this steel mill to find potential breakdowns before they happen.
- Relocating stockrooms for greater efficiency.
- Standardizing bearings wherever possible.

Most of our customers know and use these services.

A call to our nearest branch will make them available to you!

Providing bearing service in the territories adjacent to our branches, listed below.

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OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Mansfield • Toledo • Youngstown • Zanesville
INDIANA: Ft. Wayne • Indianapolis • Muncie • Terre Haute
PENNSYLVANIA: Erie • Johnstown • Philadelphia • Pittsburgh • York
WEST VIRGINIA: Charleston • Huntington • Wheeling
NEW JERSEY: Camden • **MARYLAND:** Baltimore
DELAWARE: Wilmington •
Subsidiaries: Balanrol Corp. • Buffalo, N.Y.• Kentucky Ball and Roller Bearing Co. • Louisville, Ky.

PAUL JORDAN
Dodge Mfg. engineering dir.

CLARENCE C. GRIFFITH JR.
Copco Steel & Eng. post

D. S. LILLIBRIDGE
Chicago Tramrail sales mgr.

DR. ALEX STEWART
R-N Corp. president-gen. mgr.

JOHN S. VOLLMER
Electro-Motive Div. p. a.

JACK J. LEVAND
Luria Bros. v. p. transfers

tired. Mr. McCormick was director of manufacturing.

Dr. Alex Stewart, former director of research, National Lead Co., and supervisor of its atomic energy activities, was elected president and general manager of **R-N Corp.**, New York, owned equally by National Lead and Republic Steel Corp.

John S. Vollmer was appointed purchasing agent, Electro-Motive Division, **General Motors Corp.**, at La Grange, Ill. Former assistant purchasing agent, he succeeds **Martin C. McGowan,** retired.

Dr. Kenneth W. Brighton was made director of research at **American Can Co.'s** new products department, Barrington, Ill. He continues supervision of the department. Dr. Brighton succeeds **Dr. Robert W. Pilcher,** who was named scientific co-ordinator.

Robert R. Bowman was made Buffalo district sales manager, **Harbison-Walker Refractories Co.**

Jack J. Levand, vice president of **Luria Bros. & Co. Inc.,** transfers from Cleveland to the Los Angeles district offices, effective Oct. 1, to head expanding operations in that territory.

General Electric Co. named **George D. Klump** manager-manufacturing engineering, small steam turbine department, Fitchburg, Mass.

Loren F. Working was named vice president, **Gen-A-Matic Corp.,** Van Nuys, Calif.

John D. Knox was appointed head of project engineering for **Adamas Carbide Corp.,** Kenilworth, N. J. He was production manager of Sintercast Corp. of America.

Gerard J. Wendelken was named vice president and general manager, **American Searchlight Corp.,** New York.

John F. Kooistra was named western regional manager, machinery and systems division, **Carrier Corp.,** with offices in Los Angeles.

Paul Jordan, plant engineer at **Dodge Mfg. Corp.,** Mishawaka, Ind., was appointed director of engineering.

Clarence C. Griffith Jr. was made director of manufacturing, **Copco Steel & Engineering Co.,** Detroit. He has served in engineering posts with General Motors Corp. and Chrysler Corp.

D. S. Lillibridge, former Detroit district sales manager, was made sales manager of **Chicago Tramrail Corp.,** Chicago. **Walter E. Spink,** formerly with General Motors Corp.'s Fisher Body Division, was made district sales manager at Detroit.

T. C. Ohart was named general manager of **General Electric Co.'s** insulating materials section, chemical materials department, Schenectady, N. Y.

John F. Flood was named manager of reinforcing bar sales, Chicago area, for **United States Steel Supply Division,** U.S. Steel Corp. **Edward K. Alexander** was made assistant manager.

Alectra Division, Consolidated Electrodynamics Corp., Pasadena, Calif., named **Willard T. Holmes,** director of engineering; **Roy K. Stephens,** director of manufacturing.

John J. Mallory was named vice president and general manager, **Rango Iron & Steel Works,** Chula Vista, Calif.

OBITUARIES...

Lester J. Blackford, 56, executive vice president, **Johnson Welding Equipment Co. Inc.,** Chicago, died July 31.

Walter A. Bates Sr., 69, chairman, **Walter Bates Co.,** Joliet, Ill., died Aug. 1.

Roger W. Straus, 65, retired chairman, **American Smelting & Refining Co.,** New York, died July 28.

Joseph H. Gwynne, 52, president, **J. H. Gwynne Inc.,** Camden, O., died July 24.

Frank J. Weitekamp, 42, secretary and controller of **Thor Power Tool Co.,** Chicago, died July 27.

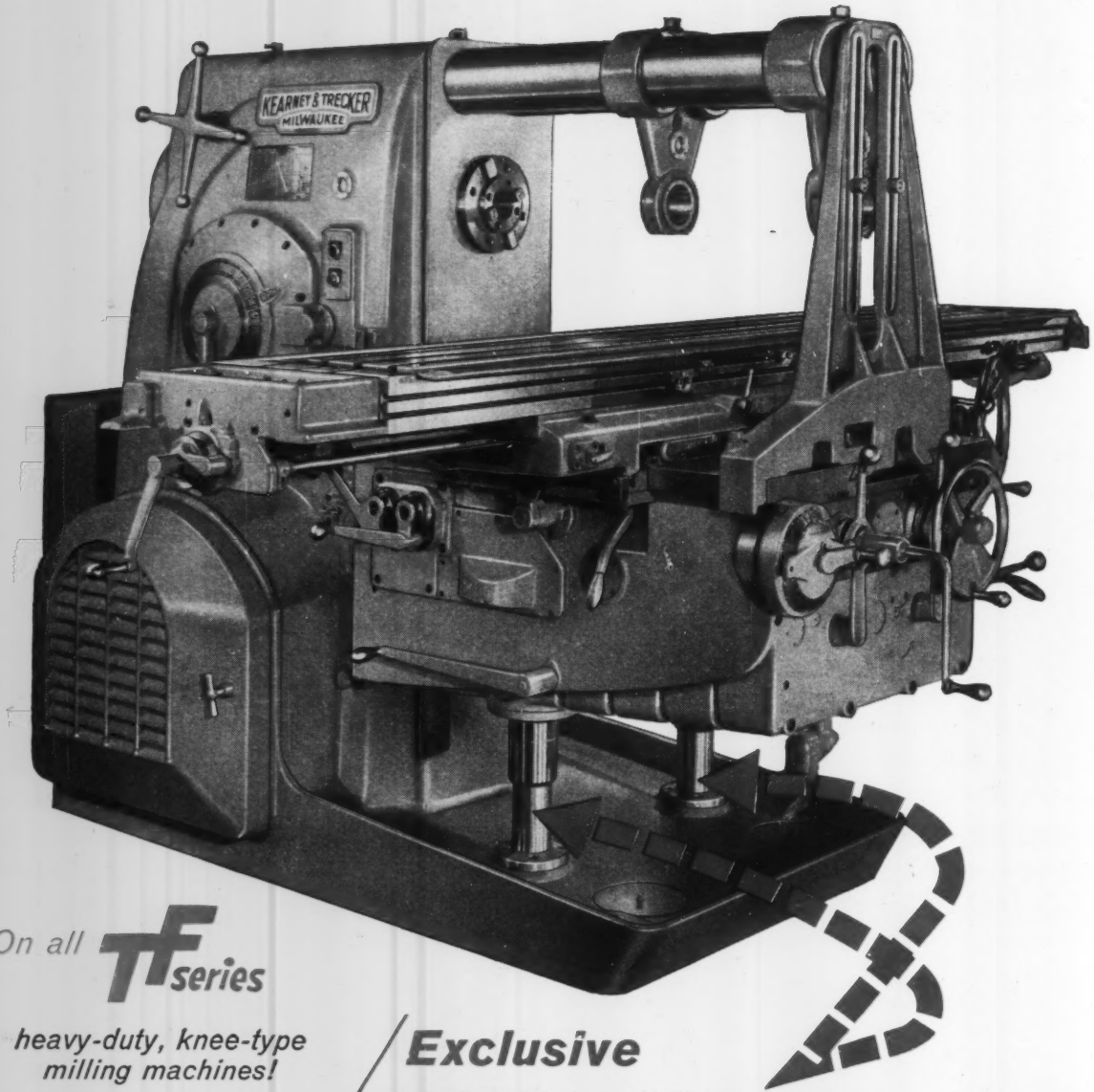
A SLIGHTLY FANTASTIC success story...

Lee Wilson Single Stack Annealing Furnaces outsell all others 10 to 1

Most steelmakers can remember when it was believed that multiple stack annealing was the answer to greater production. But little more than a decade ago, Lee Wilson engineers developed high connection annealing and found the best medium of this high-speed method to be the single stack furnace.

At first, steelmakers were reluctant to accept a smaller furnace. However, production figures and quality checks proved the single stack high convection system vastly superior to old style methods, and soon all leading steel producers were experimenting with pilot installations.

Today, the single stack is outselling multiples all along the line—and Lee Wilson is outselling all others 10 to 1. The answer is simple. The single stack has proved itself to be a better annealing method and, Lee Wilson, the originator, naturally knows more about single stacks than any other manufacturer.



On all **TF** *series*

heavy-duty, knee-type milling machines!

Exclusive

KEARNEY & TRECKER MILWAUKEE ***twin elevating screws***

INCREASE ACCURACY 3 TIMES

over single screw designs

KEARNEY & TRECKER MILWAUKEE®

Designers and Builders of
Precision and Production Machine Tools Since 1898

Want Proof?

We'd like to show you.
Write for BulletinTF-57 on your letterhead.
KEARNEY & TRECKER CORP.,
6790 W. National Ave.,
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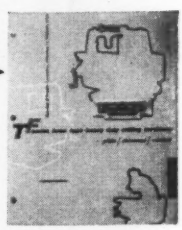

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George M. Meriwether
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SEATTLE, WASH.
Dawson Mach. Co.
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SHREVEPORT, LA.
Peerless Supply Co., Inc.
701 Spring St.

SYRACUSE 1, N. Y.
Syracuse Supply Co.
314-332 W. Fayette St.

TULSA, OKLA.
White Star Mach. Co.
104 Boulder Bldg.
19 West 10th Street

WICHITA, KAN.
White Star Mach. Co.
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CANADA
MONTREAL
OTTAWA
QUEBEC
TORONTO
WINDSOR
Williams & Wilson Ltd.

KEARNEY & TRECKER MILWAUKEE

Aluminum Fabricators Enlarge Facilities

New extrusion and rolling units will add about 4 million lb a month to the industry's output. Reynolds Metals, Eastern Rolling Mills and Western Extrusion expand

PRODUCTIVE capacity of the aluminum fabricating industry is being boosted about 4 million lb a month. Reynolds Metals Co., Western Extrusion Co. and Eastern Rolling Mills Inc. have expanded their facilities.

Reynolds Metals Co. formally opened its $5.5-million extrusion plant at Bellwood (Richmond), Va. This facility will add as much as 2 million lb a month to the industry's output. Four 2300-ton extrusion presses supply parts used by numerous industries. Extruded aluminum alloy shapes are produced by forcing cast billets (heated to a plastic condition) through a steel die opening with a force of several million pounds.

Fully Integrated—A. M. Murphy, plant manager, says the Richmond mill is a fully integrated operation designed to process aluminum pig and scrap into finished extrusions. "In addition to our extrusion department," he says, " we are equipped with modern casting facilities, a complete die manufacturing machine shop, a quality inspection department, metallurgical laboratories and a receiving and shipping department which handles the finished shapes."

Latest techniques are employed at the new plant to assure clean extrusions with precision dimensions and proper metallurgical treatment. A new method of handling which moves the extruded parts from the press runout table to the stretchers is designed to eliminate handling marks and to rapidly cool the metal to room temperature. This permits the metal to be stretch-straightened in one continuous cycle with the press.

Optical comparators are used to insure utmost accuracy. These high magnification devices project to a screen a cross section of the extrusion blown up as much as 50 times its original size. A similar comparator is used in making the dies.

Eastern Mill—Eastern Rolling Mills Inc., New York, will be operating a new aluminum rolling mill by the end of September. It will add 20 million lb a year to the firm's rolling capacity. The mill has a width capacity which meets "the bulk of demands for coil and cut-to-length stock among manufacturers in the area, whose production techniques generally require widths up to 30 in.," says Herbert Barchoff, president.

An x-ray gage enables rolling to be accomplished to a tolerance of 0.0001-in. in special circumstanes. Other features of the mill are a hydraulically controlled edgewise gage and a powerful back tension system. A final improvement is a lubrication system which delivers 250 gal of oil per minute to the rolls under pressure of 75 psi.

A slitter of "radically different design," is nearing completion at Eastern and will be unveiled in September also. Other 4-high and 2-high mills have been modernized, as well as all equipment in the slitting division. The entire plant layout has been revamped to cut down material handling.

Western Mill—Western Extrusion Co. has opened an aluminum plant at 1439 W. 178th St., Los Angeles. The company installed a 1400-ton press with complete facilities for precise tolerance and fine finish of either standard or custom shapes.

Trevor Steel Changes Hands

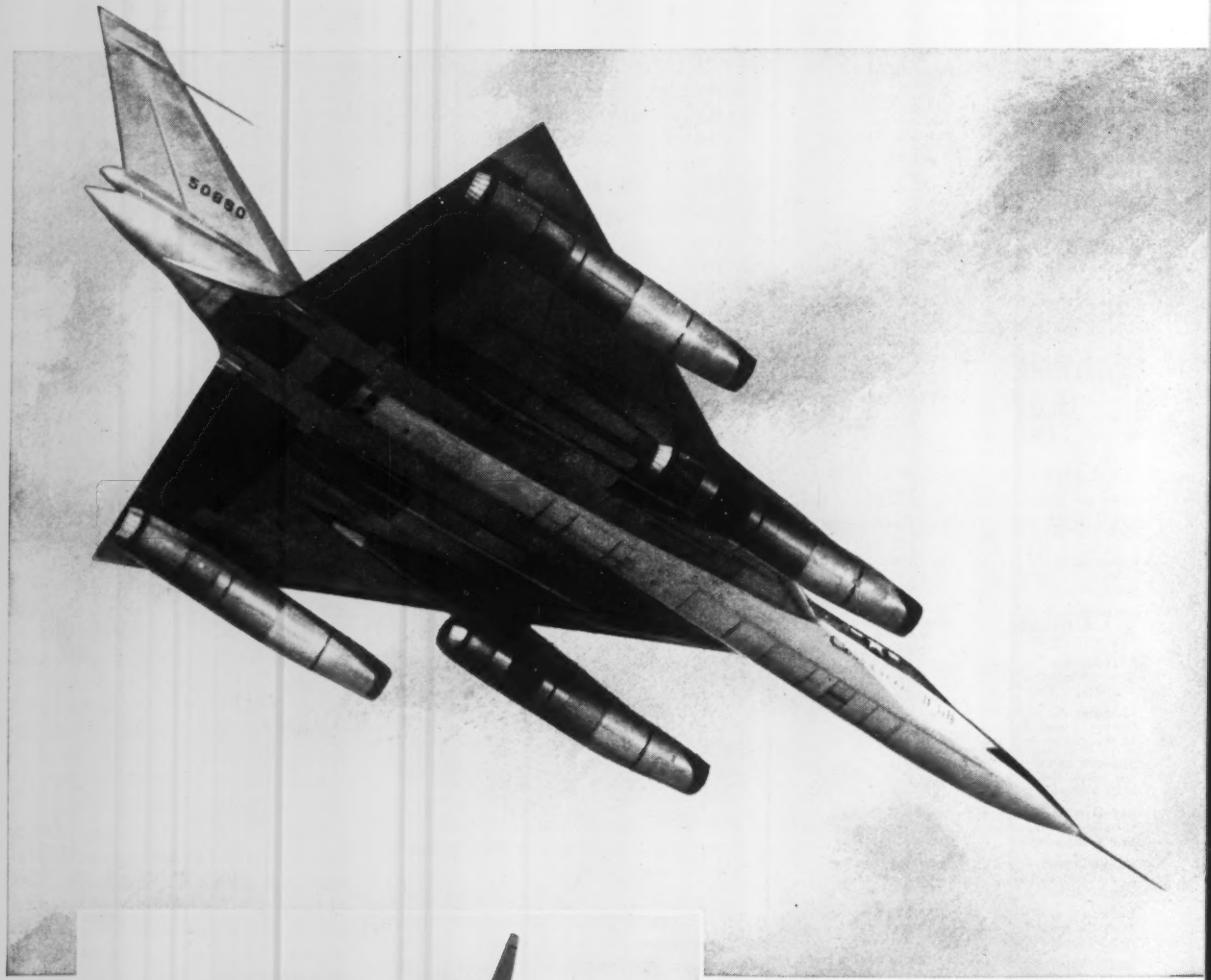
Trevor Steel Co., Center Line, Mich., has been purchased by George E. Lott, president, and L. V. Erickson, vice president and treasurer. Herbert R. Andrich is secretary.

Air Reduction Building

Air Reduction Sales Co., a division of Air Reduction Co. Inc., New York, is building an air separation plant in Acton, Mass. Cost of the plant, including distribution

(*Please turn to page* 104)

Republic Titanium Flies with



The B-58 is built for the Air Force by Convair, A Division of General Dynamics Corporation, Fort Worth, Texas. Powered by four General Electric J-79 engines, the plane is designed to operate at altitudes above 50,000 feet. Photo at left is one of the first showing detachable pod under fuselage. This feature permits performance of a greater variety of missions.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

Convair's B-58 Hustler

Republic titanium alloys used for elevated temperature applications and weight saving in America's first Supersonic Bomber

The delta-winged B-58's transformation from drawing board to production in record-breaking time is a tribute to the design-and-engineering skill of Convair Division, General Dynamics Corporation.

This dream plane incorporates the most advanced equipment and utilizes the latest engineering materials, including Republic Titanium.

Titanium alloy types produced by Republic Steel are used in the B-58 for weight saving and elevated temperature applications. These particular titanium alloys are among the strongest now being produced. They offer high strength values at elevated temperatures.

These alloy types have a minimum tensile strength of 130,000 p.s.i. and a minimum yield strength of 120,000 p.s.i. They meet the demand for high strength to resist the effects of aerodynamic heating in supersonic aircraft, such as the B-58.

The Hustler is the world's fastest bomber. What about the future? Right now, planes are being designed for speeds of Mach 3 or 4. Republic is keeping pace. At the Titanium Research Laboratory in Canton, Ohio, new titanium alloys are being developed with better physicals to provide greater operating efficiencies.

In exploring the "thermal thicket", many materials must be appraised and utilized. Republic—world's largest producer of aircraft steels—is working on new high-tensile, stainless types with higher strength and greater heat-resistance.

Republic metallurgists and engineers pioneered the development of high strength-to-weight metals. They offer you years of experience gained through helping hundreds of manufacturers design and redesign their products to get more strength with less weight at less cost. Contact your local Republic sales office for more information. Or send us the coupon.

STEEL

and Steel Products

OTHER REPUBLIC PRODUCTS FOR THE AIRCRAFT INDUSTRY

WEDGE-LOCK STEEL SHELVING ADJUSTS QUICKLY and easily to stock changes at Sikorsky Aircraft Company. Parts move out of storage and into production fast at the company's Bridgeport, Connecticut, plant. Wedge-Lock permits a systematic arrangement of stock for immediate identification. When inventory changes occur, shelves are quickly and easily rearranged. Wedge-Lock Steel Shelving is specifically designed for high stacking of enormous weights. There is no distortion or instability. Republic's storage engineering service is available without obligation. Mail coupon for facts.

ENDURO STAINLESS STEEL IS MADE FOR FLIGHT in both military and civilian aircraft. Above, it is used in an airliner galley for food-serving equipment. ENDURO is easy to clean and keep clean. Resists rust and corrosion. Will not chip, crack, flake, peel or tarnish in tough service. ENDURO offers the design engineer numerous benefits in the form of high strength-to-weight ratio, toughness, heat-resistance, corrosion-resistance. ENDURO is the aircraft metal of many uses, from galley to cockpit, from power plant to skin. Republic will help you apply it to advantage.

REPUBLIC STEEL CORPORATION
DEPT. C-4050
3120 EAST 45th STREET • CLEVELAND 27, OHIO

Have a metallurgist call. ☐ Titanium ☐ Stainless

Send more information on:
☐ Titanium ☐ ENDURO® Stainless Steel
☐ Wedge-Lock Steel Shelving

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

700 PARK CLOSED-DIE FORGINGS

. . . Wt. 2750 Lbs. Ea.

SAVE MACHINING TIME
Eliminate
"POROSITY REJECTS"

for manufacturer of automotive glass-making machinery

A Park sales engineer showed this manufacturer of an automated glass-making line how to save money by using large, closed-die forgings. These Park closed-die forgings were closer to being completed parts—needed a minimum of final machining. Uniform in quality, they required less inspection. And there was no danger of investing expensive machine time in parts—then have them rejected because they contained "blow-holes" or porosity defects.

One of the largest production runs of closed-die forgings ever scheduled for the machine tool or machinery field, these 700 forgings, each weighing 2750 lbs., were produced in Park's shops in record time.

Let our sales engineers show you how a Park closed-die forging can cut down machine time and rejects—increase strength and safety on your product requirements.

Die Forging Specialists Since 1907

THE PARK DROP FORGE CO.
775 EAST 79TH ST. • CLEVELAND 3, OHIO

Carbon, Alloy, Heat-Resistant Alloy, and Stainless Steel Closed-Die Forgings from 5 lbs. to 5000 lbs.

(*Concluded from page* 101)

facilities, will be more than $9 million. It will produce 75 tons of liquid oxygen, nitrogen and argon a day.

Installs Annealing Furnace

Worcester Pressed Steel Co., Worcester, Mass., has installed an annealing furnace capable of treating 700 lb of stampings an hour. The unit can handle low carbon and stainless steels and nonferrous metals. It was manufactured by C. I. Hayes Inc., Cranston, R. I. An automatic soap coater which works with the new furnace also has been added.

Acme Chain Corp. Expands

Acme Chain Corp. is operating its $800,000 plant in the Springdale Industrial Park, Holyoke, Mass. The plant contains 100,000 sq ft of space. New equipment valued at $100,000 was installed during the transfer from the firm's former quarters in that city.

ASSOCIATIONS

Anti-Friction Bearing Manufacturers Association, New York, elected these officers: President, Howard A. Johnston, Marlin-Rockwell Corp., Jamestown, N. Y.; vice president, R. S. Wood, Link-Belt Co.'s Ball & Roller Division, Indianapolis; treasurer, E. B. Thompson, Torrington Co., Torrington, Conn. Harry Smith is permanent secretary and manager.

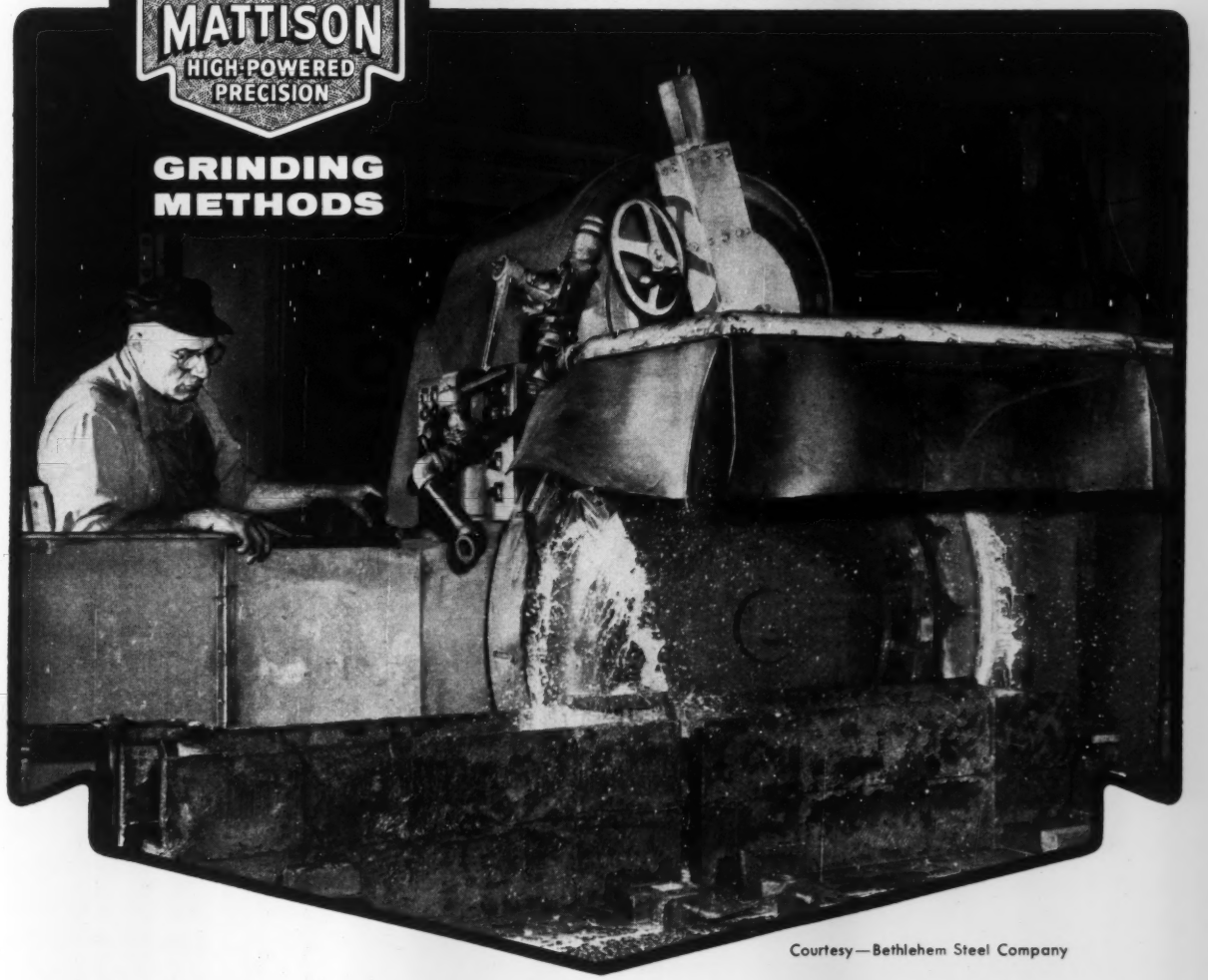
Drop Forging Association will move Nov. 1 from Lansing, Mich., to the Illuminating Building now under construction in Cleveland. Dwight M. Allgood is executive vice president. Forging sales totaled $693 million in 1956 and "should reach $1 billion within the next ten years," says Charles H. Smith Jr., president of the association and Steel Improvement & Forge Co., Cleveland.

Society of Mining Engineers, American Institute of Mining, Metallurgical & Petroleum Engineers, New York, has announced that Stanley D. Michaelson of Ken-

CASE HISTORY No. 33—CAST STEEL BRAKE BASES

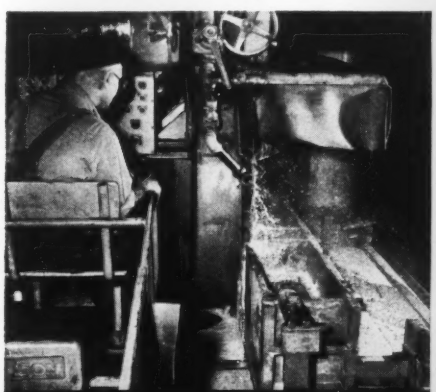
MATTISON
HIGH-POWERED PRECISION

GRINDING METHODS



Courtesy—Bethlehem Steel Company

Switch from planer to face grinder boosts production 200 to 300 per cent



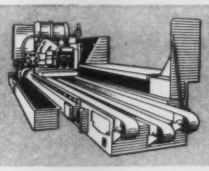
All controls are conveniently located in front of the operator. Skill requirements have been reduced on many jobs in this plant.

Large cast steel brake bases, formerly machined on a planer, are finished three to four times as fast and more efficiently on this Mattison "UK" Traveling Wheel Face Grinder. Surface finish has been improved considerably, and it is now easier to machine the brake bases to required accuracy limits. The machine is so simple to operate and easy to set up, operator skill requirements have been reduced with resultant savings in direct cost.

Many jobs formerly done on a planer or milling machine are now being machined faster and more efficiently on the Mattison "UK." The large traveling wheel—feeding at the end of each stroke—takes a positive cut and covers the entire work surface on each pass. All cuts are finishing cuts, whereas first operations on the planer or milling machine had to be roughing cuts.

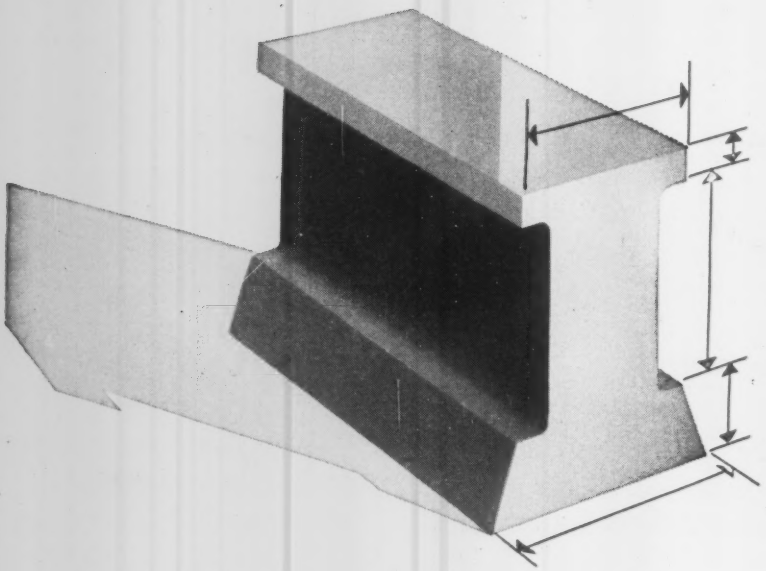
This Mattison Face Grinder offers an excellent solution to the problem of grinding large, heavy, and over-length parts. Floor space required is only half that needed for a traveling table machine. Write for Bulletin No. 844.

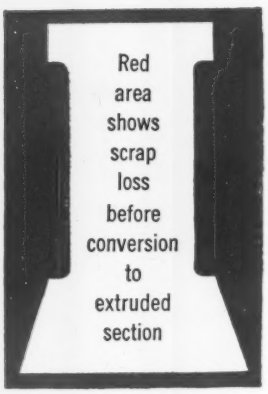
MATTISON
MACHINE WORKS
ROCKFORD ILL. U.S.A.



HIGH-POWERED
PRECISION
SURFACE
GRINDERS

Cost per clamp cut from $1.06 to 58¢ with J&L hot extruded cold drawn section





This manufacturer cut the cost of contact clamps 45% by converting to J&L extruded sections. Previous cost of $1.06 per part involved costly milling and scrap loss from cold drawn 1½" x 1" flats.

Here's how extruded sections can cut your cost:

1. Eliminate machining and finishing operations.
2. Reduce scrap losses almost to zero.
3. Eliminate cost of casting and forging intricate sections.
4. Reduce inventories because extrusions are quickly available.

Investigate this new production technique for your shape profiles—within present limits of a design which can be inscribed in a three-inch circle. Available in a wide range of carbon and alloy steels. For specialty alloy and tool steels, submit inquiry. Get complete details by writing to the Jones & Laughlin Steel Corporation, Dept. 404, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Jones & Laughlin STEEL ... a great name in steel

necott Copper Corp.'s Western Mining Division, Salt Lake City, Utah, has been nominated for 1958 president of the society. The current president is E. A. Jones of St. Joseph Lead Co.'s Southeast Missouri Division, Bonne Terre, Mo.

CONSOLIDATIONS

Discussions are being held by officials of **General Dynamics Corp.**, New York, and **Liquid Carbonic Corp.**, Chicago, regarding the possibility of a merger of the two companies. Liquid Carbonic would become a division of General Dynamics with R. L. Nicholson retaining his position as senior executive officer of the division.

Propulsion Engine Corp., South Milwaukee, Wis., a subsidiary of Food Machinery & Chemical Corp., San Jose, Calif., purchased **Titan Chain Saw Co.**, Seattle.

National Supply Co., Pittsburgh, purchased **Howard Electric Co.**, Melrose Park, Ill., producer of industrial duct and fittings.

Corry Aero Supply Co., Corry, Pa., purchased the **L. J. Wing Mfg. Co.**, Linden, N. J., maker of unit type heaters.

Apex Smelting Co., Chicago, acquired full ownership of **National Metallurgical Corp.**, Springfield, Oreg., by purchase of the one-half interest held by American Smelting & Refining Co., New York. The Oregon firm is engaged in the experimental production of aluminum silicon alloys and silicon metal.

H. K. Porter Company Inc., Pittsburgh, acquired **Cleveland Hardware & Forging Co.**, Cleveland, manufacturer of drop forgings, diecastings and automotive and commercial hardware. H. E. White, president of the forging concern, will be general manager of Porter's Cleveland Division.

Milton Roy Co., manufacturing engineer of Philadelphia, purchased **Anders-Lykens Co.**, Lykens, Pa., manufacturer of instrument air dryers and gas dehydrators.

(*Please turn to page* 110)

MEET "LITTLE STEVE"

NEW SPACE SAVING, LOW COST UNIT WITH AUTOMATIC LOAD AND UNLOAD

Here's What ***"LITTLE STEVE"*** *can do Automatically*

- ELECTROPLATING
- ANODIZING
- BLACK JAPANNING
- ENAMELING
- ELECTROTYPE PLATING
- PLASTIC COATINGS
- BRIGHT DIPPING
- PHOSPHATE COATINGS

UP TO 40,000 PIECES PER DAY
540 RACKS OR ARMS PER HOUR

Yes, this new immersion processing machine by Stevens can process up to 40,000 pieces per day — and it has a variety of other uses too.

Ruggedly built, "Little Steve" can be obtained at a surprisingly low initial cost. It is ideal for large or small companies for it will fit many production cycles. It uses an arm as a rack or will take racks for small parts.

Being of small size it offers no floor space or load problems; involves low solution expense and means a small capital investment. It can be used easily as a laboratory testing machine.

For further information about "Little Steve" write for illustrated folder or call your local Stevens sales engineer.

FREDERIC B. STEVENS INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

STEVENS 75 YEARS OF SERVICE

WAREHOUSES AND OFFICES IN PRINCIPAL CITIES

Can specialized business publication

By reputation, salesmen are reluctant to credit anything but their own selling efforts for getting names on the dotted line.

Actually, it's quite a different story. The most successful salesmen will tell you two important things about selling. 1. That the selling process is largely a matter of communicating ideas. 2. And that specialized business publication advertising can help importantly to register information with prospects.

Of course each salesman will express this in his own way...but they all agree that selling would be far more difficult without the advertising that appears in the industrial, trade, and professional publications that serve the specialized markets to which they sell.

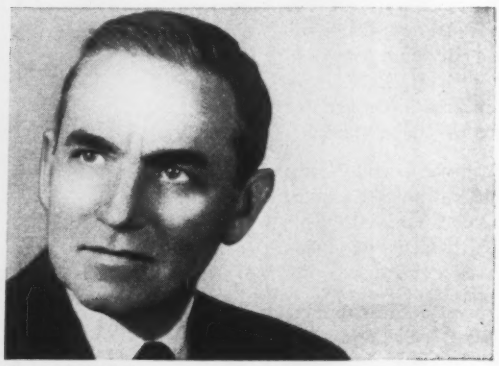
Here, for instance, is what three salesmen say about this kind of advertising:

William W. Cox
AMP, Incorporated *sells to industry*

Says Mr. Cox:

"The quickest way we can introduce a product is by introducing it through advertising in business papers. That way we get it around faster than we can by word of mouth alone. On occasion my home office has inquiries out to me before I can get to the customer or prospect to introduce a new product. They've already seen it in a trade magazine.

"It's interesting to note that within the last two weeks I received a survey which shows about 80% of the new customers we get on our books comes through our trade publication advertising. Of course, our company is only 15 years old and we have grown from what you might say, *nothing*, to the biggest in our business. Certainly a lot of that has come from our advertising campaigns. Our name is known throughout the world right now, purely because of our advertising program. When I go to a prospect now, they know my company, they know my product . . . it makes my job easier, and opens doors when I have to make cold calls."



George A. Ecclesine
Gerberich-Payne Shoe Co. *sells to retailers*

Says Mr. Ecclesine:

"We couldn't get along without trade advertising in the boy's shoe business. I'll tell you why.

"Ours is not a big shoe company but we have to cover the whole country. There are just ten salesmen. Most of our business is done with the smaller retailers and you can see that we are not able to call on any one retailer too often. But our advertising can call on these fellows every month. We know that they see the ads and read them because they know who we are when we walk in the door and they're ready to start talking about the very things that have appeared in our ads.

"For instance, we had an idea that the boy's shoe business was being neglected by the general clothing store or the general shoe store, and was drifting to the men's shoe stores. To dramatize this concept of business being lost we started running a series of initials at the foot of our ads. They read BSB-FMB.

"People in the trade started asking about these initials and the mystery was built up to a climax at the shoe convention in Chicago that year. There we made it known that the initials stood for 'Boys Shoe Business is Future Men's Business.' The idea really caught on. As you can see, the whole build-up was made, quite inconspicu-

advertising actually sell?

ously too, in our trade advertising. That's just one example of how much we know these trade ads are read, and what a job they are doing for us."

Fred Snyder, Cleveland District
Worthington Corporation

sells to industry

Says Mr. Snyder:

"We have, of course, sales leads from our business paper advertising that are forwarded to us on a monthly basis. But also the trade advertising has its impact on many who do not at the time request specific information. Worthington is far better known today than it was five years ago, due in no small measure to the aggressiveness of its advertising and sales promotion department.

"Their work makes my job easier. First of all, we have an entree in companies where some Worthington products were not previously as well-known as our original line. We're getting a lot better sales coverage on all products. The Corporation manufactures so many products today that even regular customers may be unfamiliar with some of these products. Through trade advertising and sales promotion we have been able to sell the whole Worthington line.

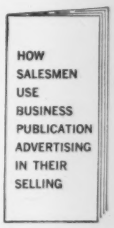
"Getting back to sales leads—they are particularly helpful to our dealers. In Cleveland, W. M. Patterson Supply will undoubtedly receive inquiries from Worthington's advertising. Scott-Tarbell, Inc., Cleveland Oak Belting, or other dealers handling special product lines will pick up leads from our advertising to help them get business.

"I think we've grown eightfold since the war. This year we hit two hundred million. It used to be that twenty-five million was a good year. The advertising and sales promotion department has aggressively been attacking their part of the problem within the last five years. Prior to that the name Worthington was not nearly so well known and we put much less emphasis on advertising."

Ask your own salesmen what your company's business publication advertising does for them. If their answers are generally favorable you can be sure that your business publication advertising is really helping them sell. If too many answers are negative it could well pay you to review your advertising objectives—and to make sure the publications that carry your advertising are read by the men who must be sold.

How salesmen use their companies' advertising to get more business

Here's a useful and effective package of ideas for the sales manager, advertising manager or agency man who would like to get more horsepower out of his advertising. Send for a free copy of the pocket size booklet entitled, "How Salesmen Use Advertising in Their Selling," which reports the successful methods employed by eleven salesmen who tell how they get more value out of their companies' advertising.



You'll find represented many interesting variations in how they do this. Some are very ingenious; all are effective. You can be sure that more of your salesmen will use your advertising after they read how others get business through these simple methods.

The coupon is for your convenience in sending for your free copy. Then, if you decide you want to provide your salesmen with additional copies, they are available from NBP Headquarters in Washington, at twenty-five cents each. Or if you choose you can reprint the material yourself and distribute it as widely as you please. But first, send for your free copy.

NATIONAL BUSINESS PUBLICATIONS, INC.

NBP

...each of which serves a specialized market in a specific industry, trade or profession.

NATIONAL BUSINESS PUBLICATIONS, INC.
Department 1A
1413 K Street, N. W.
Washington 5, D. C. **STerling 3-7533**

Please send me a free copy of the NBP booklet "How Salesmen Use Advertising in Their Selling."

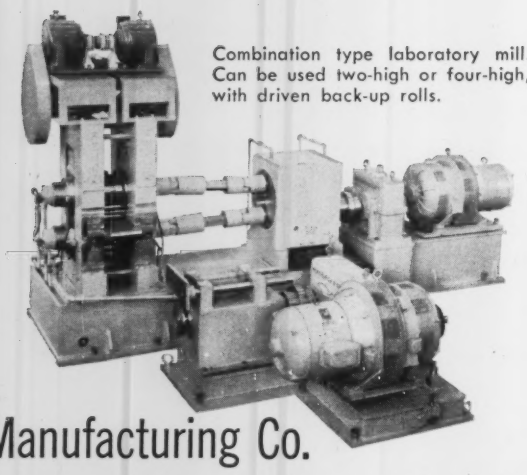
Name _____

Title _____

Company _____

Street Address _____

City _____ Zone _____ State _____



Combination type laboratory mill. Can be used two-high or four-high, with driven back-up rolls.

Why

Fenn Manufacturing Co.

equips its precision rolling mills with

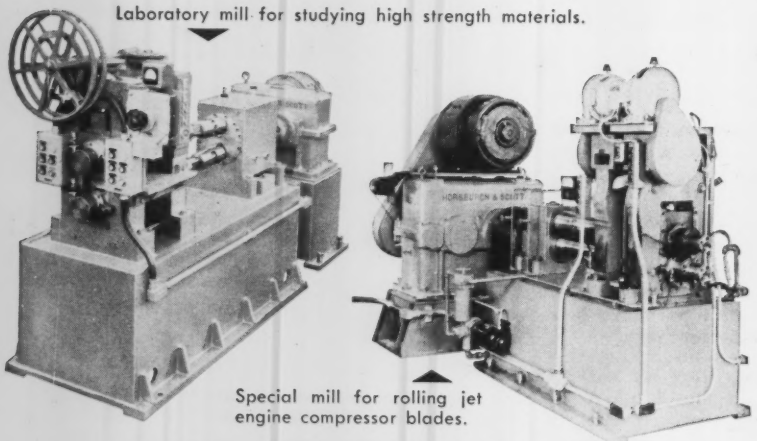
H & S Speed Reducers and Gears

Manufacturers of precision metal forming equipment, the Fenn people necessarily must buy carefully when selecting components from other sources. When it comes to speed reducers and worm and gear sets, they rely on *Horsburgh & Scott.*

The Fenn rolling mills illustrated here are built to order for both production and laboratory use. H & S Speed Reducers are in evidence, sized to suit the need. H & S worm and gear sets are used in the screw down mechanisms.

The rugged dependability of H & S products, helpful and flexible engineering service, and reliable delivery performance are principal values in a continuing profitable relationship . . . There's a solution to *your* power transmission problem in the broad lines of gears and assembled units made by H & S. Write us, or contact your nearby H & S representative.

Laboratory mill for studying high strength materials.



Special mill for rolling jet engine compressor blades.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 Hamilton Avenue

Cleveland 14, Ohio

(*Concluded from page* 107)

Kelsey-Hayes Co., Detroit, purchased **Control Specialists Inc.**, Inglewood, Calif., an engineering and research firm. A. P. Henry is general manager and I. L. Ashkenas is chief engineer of the new division.

Wabash Mfg. Co. Inc. and **Greenwood Engineering Co. Inc.**, both Baltimore firms, have merged their operations. Wabash, a maker of machinery and machinery parts, will perform all manufacturing work connected with the production of printer-slotter machines. Greenwood, operating as a wholly owned subsidiary, will concentrate on development and sales aspects of the business.

Archer-Daniels-Midland Co., Minneapolis, purchased **Federal Foundry Supply Co.**, Cleveland, producer of seacoal, core washes, foundry facings, parting compounds, core and mold blowing machines, bentonite and vermiculite. The firm sells a full line of foundry supplies and equipment.

Haile Mines Inc., New York, is acquiring **Frank Samuel & Co.**, a mineral, metal and chemical export-import firm and refractories manufacturer of Philadelphia.

NEW ADDRESSES

George K. Garrett Co. Inc. is now located in its $2-million 280,000 sq-ft building on Torresdale avenue at Tolbut street, Philadelphia 36, Pa.

E. W. Bliss Co.'s Press Sales Division moved its Cleveland office to 1400 Brookpark Rd., Cleveland 9, O.

Wheelock, Lovejoy & Co. Inc., Cambridge, Mass., moved into its new Detroit district office and warehouse at 23220 Pinewood Ave., Warren, Mich. Edward S. Waltz is district manager.

Cochrane Water Conditioning Ltd., subsidiary of Cochrane Corp., Philadelphia, moved its headquarters to 1355 Martin Grove Rd., Toronto, Ont.

Aliquippa Works
Jones & Laughlin Steel Co.
Aliquippa, Pa.

An ingot a minute!

and never a lubrication failure with Cities Service EP-21 Lubricant!

At Jones & Laughlin's Aliquippa Blooming Mill, they believe in production with a capital "P"!

Not only does J&L's Aliquippa Mill hold the world's record for ingots rolled in an eight hour turn (576), but they've set a year-in, year-out average of an ingot per minute!

How do they sustain this production for such long periods?

One answer lies in their modern, 44-inch, two-high reversing unit, powered by four 3000 h. p. motors arranged in tandem twin drive.

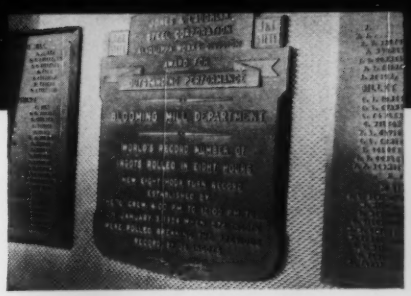
Another can be found in their lubricant . . . Cities Service EP-21.

Used on main bearings, manipulator slides and window liners, Cities Service EP-21 and its superior additives provide an unusually tough film . . . tough enough to stand the highest pressures, the greatest shock loads with no loss of lubrication, no danger of rust or corrosion.

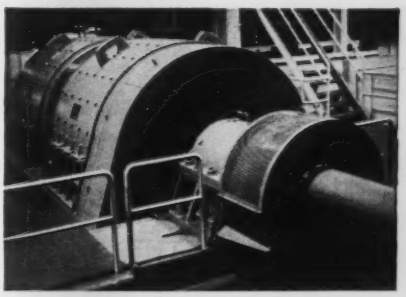
Yes, Jones & Laughlin is pleased with Cities Service lubricants! You'll feel the same when Cities Service goes to work in your operation. Talk with your Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



Award for 8-Hour Turn Record is displayed proudly outside mill. J&L smashed previous record by 38 ingots—rolled up new total of 576! Year-in and year-out, the plant averages an ingot a minute, with flawless lubrication provided by Cities Service.



Four 3000 h.p. Motors power the blooming mill at J&L's Aliquippa Works. These are 70 to 140 rpm, double-armature units arranged in tandem twin drive. At 70 rpm, they can reverse in under a second. Equally flexible is the mill's lubricant—Cities Service EP-21.

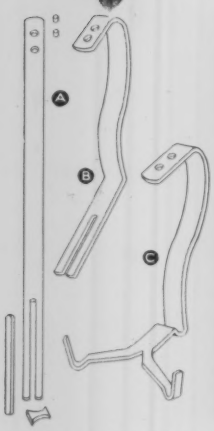
top performance IN MASS PRODUCTION

60 vaporizer stands per minute . . . automatically formed in one operation on an A. H. Nilson combination press and 4-slide. Kaz Vaporizer stands are a proof that clever product design, combined with precision tooling by Nilson, increases production and lowers costs.

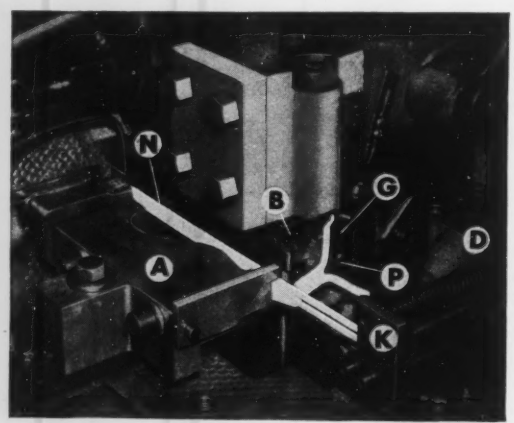
NILSON 4-SLIDES FEATURE—

- ONE-MAN OPERATION
- FORMING OF WIRE OR RIBBON METALS FROM THE COIL
- ONE FAST, AUTOMATIC OPERATION WHICH STRAIGHTENS, FEEDS, PIERCES, BLANKS, SWAGES, STAMPS OR COINS, CUTS OFF, FORMS
- CRITICAL TOLERANCES UP TO .002 ON ANY RUNS
- FAST TOOL AND DIE CHANGING
- WIDE SIZE RANGE—FORMS WIRE UP TO ½ IN. DIA. IN FEEDS TO 32 IN. MAX. AND RIBBON STOCK UP TO 3½ IN. WIDE
- PRESS SECTIONS—5 TO 30 TON CAP.
- HEAVY DUTY MODELS—50 AND 75 TON CAP.

Without obligation, Nilson provides specific forming recommendations from detailed information. Send for A. H. Nilson catalogue . . . the first step to increased production.



Stand is zinc-plated steel strip 0.05 in. thick by 0.625 in. wide . . . made in steps A, B and C.



Final step in forming Kaz stands on Nilson 4-slide. Feet are spread, bent, crimped (G) with workpiece (P) on centerpost while next piece (N) is being cut off. Stop (K) on right slide (D) backs off after cut and workpiece (P) is wrapped around centerpost by die (A) when finished part is clear.

THE A. H. NILSON MACHINE CO.
1512 Bridgeport Ave., Shelton, Conn.

NILSON

Get Set for Metalworking's Fabulous Future . . .

How Shall We Deal with Our Workers?

During the last two decades, management lost ground to the unions in dealing with employees. As unions moved in, management tended to move back. To many, unionism became a mote in the eye.

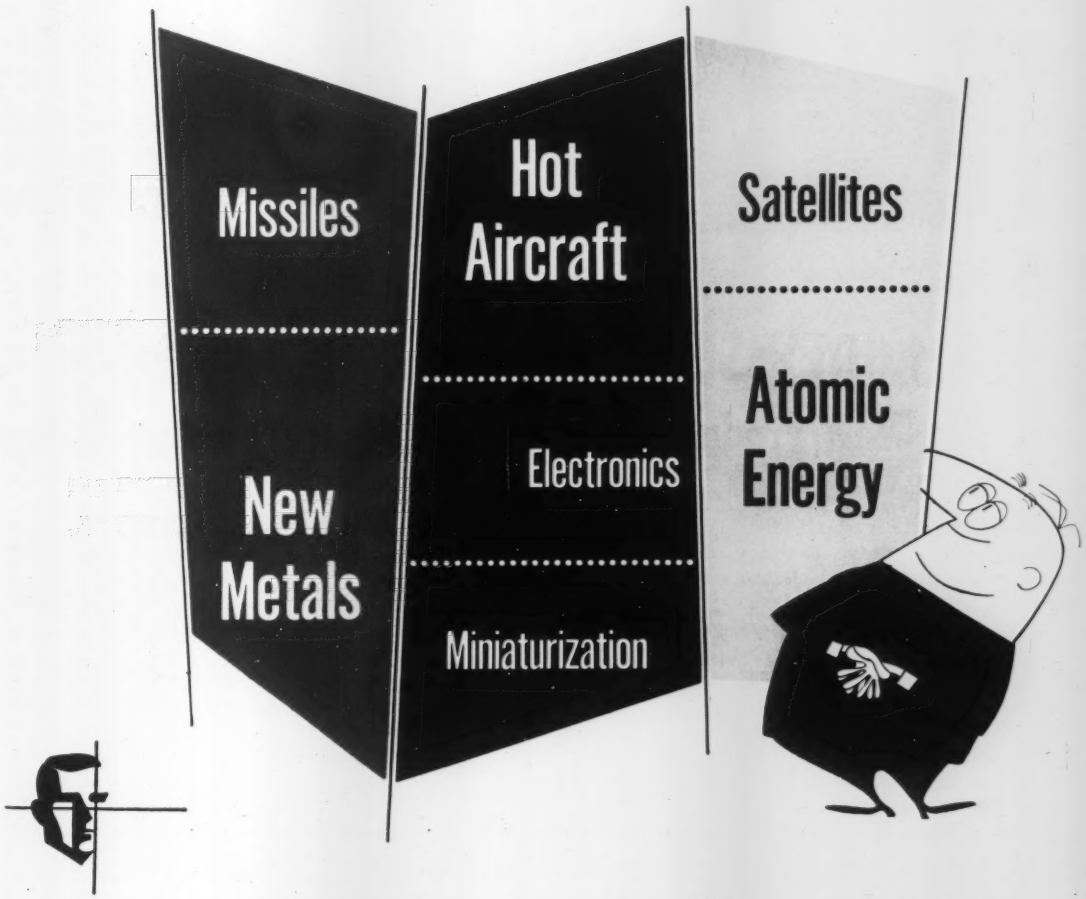
The time is coming when management must recapture the leadership of its people.

How? STEEL's eighth article in its 1957 Program for Management (coming Sept. 16) will answer that and other questions.

Articles published to date:

1. **The Care and Feeding of the Junior Executive**
   (Feb. 11, p. 93)
2. **Grooming Middle Managers**
   (Mar. 18, p. 93)
3. **Profit Sharing**
   (Apr. 15, p. 115)
4. **Inventory Management**
   (May 13, p. 109)
5. **Managing Our Markets**
   (June 17, p. 93)
6. **Research: Threshold to the Future**
   (July 15, p. 93)
7. **Producing for the New Technology**
   (Aug. 12, p. 113)

Extra personal copies of these Program for Management articles are available until the supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.



Producing for the New Technology

A MAKER of sleeve bearings devised a process for making atomic fuel elements, then set up a plant for them.

A producer of stainless steel strip developed a 1 per cent boron grade for use as an atomic shield.

A valvemaker installed special test equipment to meet specs for nuclear use.

A manufacturer of railway cars acquired a neophyte atomic business and established a division to produce nuclear systems.

Those incidents have two things in common:

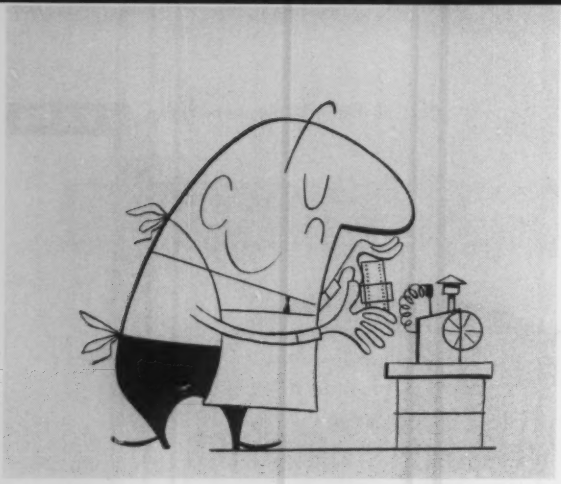
Each company is taking advantage of present opportunities to get into a new technology with a future—in this case atomic energy.

Each company is taking advantage of the fact that early birds feast on a new market while it's on the upswing.

Atomics is only one entree into metalworking's fabulous future. Equal opportunities are waiting in such fields as missiles, aircraft, satellites, electronics, new metals and miniaturization.

Regardless of what phase you produce for, the incidents also illustrate the basic ways you can participate:

- You can make new products—items developed specifically for the new age.
- You can modify your existing products—changes aimed at special requirements of new applications.
- You can channel established products into new areas—learn to work with rigid manufacturing specifications.
- You can acquire a new enterprise—buy talent to make futuristic products.



1. DEVISE
a New Product

• Clevite Corp., Cleveland, for many years a leading producer of sleeve bearings, developed a process to make atomic fuel elements and is setting up a plant to produce them.

Clevite management has its eye on getting its share of the fuel element market, which is expected to be in the $200 million to $300 million bracket in the early 1960s.

After investing several years of study in atomics, Clevite management came to the conclusion that its diverse divisions had the necessary know-how to step into this new field.

1. Its Cleveland Graphite Bronze Division had years of manufacturing experience in the precision rolling and forming of bimetal laminates.

2. Its research and development division has produced titanium metal parts by powder metallurgy for several years. Skills in handling reactive metals have evolved from this work.

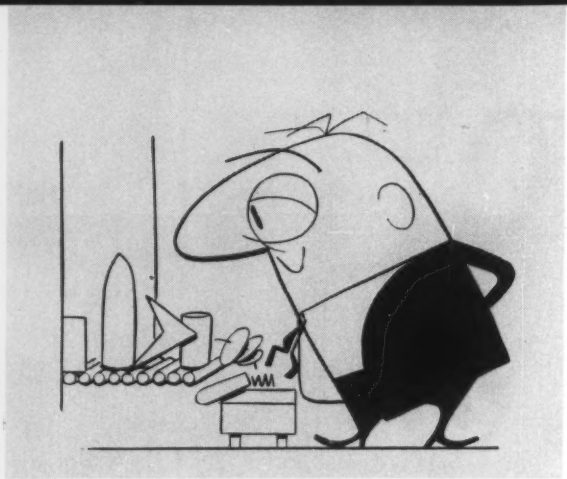
3. Its Brush Electronics Division had experience with large autoclaves (used to grow quartz crystals) which could be adapted to acceptance testing of production size fuel elements.

Clevite brought in A. D. Schwope, former division head at Battelle Memorial Institute, to manage the new facility and co-ordinate its development work and marketing activities.

Versatility was built into the plant. In the early stages of a new product like this, users will want to try out many designs. You have to be in position to accommodate them to get the business.

Clevite's facility has vacuum arc and induction melting furnaces, presses, sintering furnaces and equipment for annealing, forging, precision rolling, machining and vacuum welding.

Management had to consider a number of special manufacturing problems: For example, all metal forming equipment must be located in areas which provide for safe handling of radioactive materials.



2. MODIFY
What You Are Making

• The rolling of metals has been the sole business of Superior Steel Corp., Carnegie, Pa., since its inception 65 years ago. It has a specialist's knowledge of such materials as hot and cold-rolled stainless steel, clad metals, alloys and spring steels.

About the middle of 1954, management at Superior was looking for new products in atomics it could make with its production facilities. E. J. Reardon, executive vice president, visited the Argonne National Laboratory, Lemont, Ill.

Scientists there asked: "Can you make a 1 per cent boron stainless strip?"

The material was needed for reactor shielding (boron has a high affinity for thermal neutrons) and control applications to cut down on the weight and thickness of components.

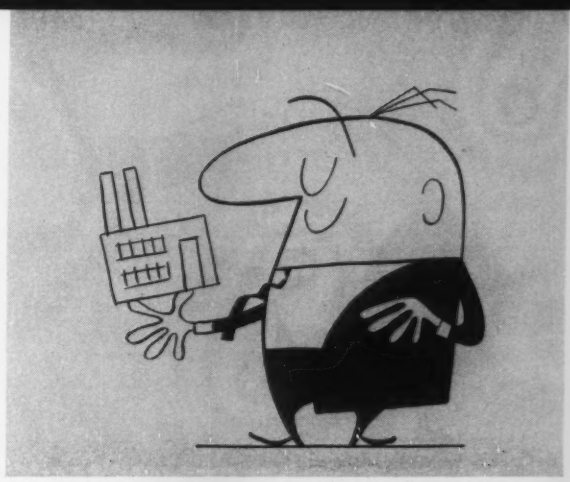
A few weeks later, Mr. Reardon and W. L. Keene, Superior's director of research and metallurgy, visited Dr. J. Alfred Berger of the metallurgical engineering department of the University of Pittsburgh. They discussed the possibility of producing an 18-8 stainless steel containing about 1 per cent boron.

Dr. Berger surveyed the literature and a development program was started—250 lb heats were produced in an induction melting furnace. Work was concentrated on developing hot rolling techniques. Soon, Superior was able to supply Argonne with samples rolled on a laboratory mill.

Argonne scientists were quick to spread the news that the new material was available. Inquiries and orders started coming in to Superior. Production climbed.

Last year, a sizable order of boron steel plates was made for the thermal shield of the EBWR reactor.

Early this year, Superior announced it was ready to supply the material in sheets, plates, strips, bars and as a clad product.



3. CHANNEL
Your Established Products

• Late last June, Crane Co., Chicago, announced that it was the first valve manufacturer to begin operation of a hot test loop to check valves slated for use in atomic reactors. It's another step the company has taken to fit its product to the atomic age.

Although Crane has been making atomic valves since the early days of Oak Ridge, it's spending $150,000 on the test loop to capture more of this attractive market. Projections based on a survey by the Atomic Industrial Forum indicate the valve and fitting side of the business will grow to $25 million annually by 1960, $90 million by 1963.

L. N. Blugerman, vice president of Crane's manufacturing operations, says the hot loop is designed primarily for production testing of completed valves but one of the loop's three test sections will be equipped so it can be adapted for engineering research, as well. He adds: "It will speed our efforts to provide valves for the Navy's nuclear propulsion program as well as deliveries for civilian atomic power plants."

The device gets its name from the extreme conditions under which it operates: Water is carried at pressures and temperatures which simulate many reactor conditions. It'll test 4 to 16 in. valves. Heart of the hot test loop is an $18,000 stainless steel canned pump. It circulates water inside the loop at a pressure differential of 100 to 150 lb.

Crane finds that the right kind of inspection equipment is the key to the manufacture of atomic valves. Any failure caused by cracks or porosity could have serious consequences. X-rays, gamma rays, magnetic particle inspection, fluorescent oils, dye stains and surface finish measurements all help.

Rough castings get maximum inspection so that defects are picked up before there is an appreciable manufacturing investment in the parts.

4. ACQUIRE
a New Enterprise

• Budd Co., Philadelphia, moved into the commercial nuclear field by the purchase of Gamma Corp., Mansfield, Mass. A small company with a lot of good ideas, Gamma needed financial help to weather the long development period often required for new atomic products. Dr. Arthur J. Stevens, who headed Gamma, is now in charge of Budd's new Nuclear Systems Division.

From the engineering and production viewpoints, the output of the nuclear division (radiographic equipment and radiation sources) has little in common with Budd's old lines—auto components and wheels and stainless steel railroad passenger cars. But Budd feels that such diversification is good. It expects the new business to help smooth out the ups and downs of the auto and railroad business.

Budd had a ready-made site for the division. It's in a building that was constructed to test combat tanks with x-ray equipment. In some sections, the concrete walls are 4-ft thick.

In radiation-proof chambers, mechanical arms and hands handle high powdered radioactive isotopes, while workers direct and observe through a window of high density glass that's 36 in. thick. Closed circuit television is also used.

By acquiring a company which had already broken into atomics, Budd was able to get going fast. It plans to maintain an inventory of the more common long-life isotopes in bulk form to expedite orders. It also will design and build equipment for controlled exposures under radiation.

The nuclear division looks like it will get into the black in a hurry. Edward G. Budd Jr., president, announced the acquisition of Gamma in the firm's 1955 annual report. In its 1956 report, he stated that he expects the division to "begin earning a profit before the end of the current (1957) year."

Where To Look

ATOMIC ENERGY—

Money spent by industry and government may get into the $5 billion a year range by the middle 1960s. A good slice of it will be for metalworking products. They include fuel elements, reactor vessels, control apparatus, heat exchangers, pumps, piping, valves, fittings, tanks, instruments and handling equipment.

MISSILES—

Dollar volume of plane and missile production is close to $8 billion annually, but the proportion spent on missiles will rise sharply to more than 50 per cent by early 1960s. As the birds become more specialized and complex, more subcontractors can participate. Present policy of the Air Research & Development Command is to channel a lot of work on development and hardware items into private industry.

HOT AIRCRAFT—

Look for a revolution in manufacturing methods. High strength, heat resistant materials will require new forming methods, new heat treating and corrosion protection techniques. Here's a chance to get in on the ground floor as a supplier by using new fabrication technology.

SATELLITES—

These manmade moons may become important in navigation and communications. One metalworking plant has fabricated 12 satellite spheres after developing techniques to make a thin magnesium shell which has no

Analyze Your Position

No matter which of the preceding approaches you use to produce for the new technology, keep this in mind: No form of technology is a magic password to success. There is no substitute for well-considered action.

Before you tackle something so new, be sure you decide what your company wants to do and what it can do. Analyze your capabilities. Be sure you know your limitations.

Essentially, three things are involved: Check your markets. Check your technical talent. Check your test facilities.

Check Your Markets

National Research Corp., Cambridge, Mass., was looking for a chance to get into production of one of the nuclear metals. The opportunity blossomed last year when the AEC asked for bids on zirconium.

A number of factors were weighed before NRC decided it would be a good thing. It had spent $6 million for research on a new process to produce titanium (and still had an extensive program going); titanium and zirconium are similar chemically.

Since 1941, the company had worked on various aspects of the atomic energy program, developing special vacuum equipment, studying vacuum melting and casting of special alloys and producing high purity metals. Such know-how is valuable in building and operating a zirconium plant because a lot of vacuum equipment is used.

Who'll Buy It?—Technical considerations seemed to be in line, but the commercial side also called for study.

NRC's director of market development, J. W. Blanton, puts it this way: "We preferred to build a plant to produce material for the open market. But keeping in mind the possibility of technological obsolescence, we wanted to be reasonably certain of an outlet for our production for a period of time."

AEC's offer to buy 3.5 million lb of zirconium at $6.50 a pound over a five-year period offered this assurance.

It often takes time to develop markets. Mr. Blanton says: "We are convinced that a sizable market would develop in commercial reactors within a few years and that a demand for use in corrosion resistant process equipment could be developed."

With a firm commitment from the AEC, NRC Metals Corp. designed a plant with enough capacity to provide surplus metal for commercial development. (Pittsburgh Plate Glass Co. recently acquired half interest in NRC Metals, which is now known as Columbia-National Corp.)

Check Your Technical Talent

Once it's determined that a broad market potential exists for a revolutionary product, your engineering competence in the area should play a part in the decision to go ahead.

Example—About three years ago, Reliance Electric & Engineering Co., Cleveland, had the chance to take on a government development contract which would lead to a business in high pressure, high temperature canned pumps for nu-

distortion. Dozens of companies are supplying other equipment, such as launching and control devices.

NEW METALS—

Titanium has skyrocketed into a $170 million a year industry. Uranium has grown from scratch to a $100 million a year business in eight years. Last year, the AEC contracted for 11 million lb of zirconium (total cost about $75 million) and 1 million lb of beryllium (total cost about $50 million). Capacity to produce vacuum melted alloys has mushroomed—it's equal to a $350 million yearly rate. There's the opportunity to produce these new metals, to develop methods for fabricating parts from them and to devise new metalworking machines to handle them.

ELECTRONICS—

Annual sales ($11.5 billion) have doubled since 1950. The rise of transistors presents new opportunities in products and components. Equally important: It's a science worth understanding because it can influence your product and manufacturing greatly.

MINIATURIZATION—

There's scarcely a product on the market today that could not be improved by a serious attempt to miniaturize it. If you want to crack tomorrow's market you had better tool up now.

clear use. (They are now a multimillion dollar business for Reliance.)

Relates L. F. Brothers, manager of the firm's Federal & Marine Division: "Our entry in the field looks like a natural one. We have a lot of experience in pump applications. We were motor experts, and we were told that the motor problems were a great deal tougher than the pump problems. We had been a leading supplier of motors for shipboard applications for years, and a large number of the canned pumps are to be used on submarines and ships."

Company sources were tapped to staff the newly formed atomic power department. Engineering and manufacturing facilities were set up behind closed doors in an existing plant.

Reliance found it had to learn techniques for welding the new metals. Development work was needed along many lines. Nonmetallic bearings, for example, were required. A high degree of testing was integrated with manufacturing.

Check Your Test Facilities

Recently, a maker of tubing could not accept an order for an atomic application because his plant didn't have the facilities for testing which the prime contractor required.

Companies going after the business in the new technologies are finding out what tests are needed and are getting set up to run them.

Examples—Steps taken recently by two foundries are typical. They installed Allis-Chalmers betatrons.

Electric Steel Foundry Co., Portland, Oreg., says it will use its 22-million-volt betatron to inspect thick castings for atomic energy, guided missile and other applications.

J. L. V. Bonney Jr., executive vice president of Bonney-Floyd Co., Columbus, O., comments: "X-ray quality in heavy castings for such things as pumps for nuclear reactors and power plants and extreme high pressure steam turbine castings and valve components has reached the point where we need our own facilities."

Case Study—Superior Tube Co., Norristown, Pa., observes that it is required to do more and more testing of small diameter tubing to meet the requirements of supersonic and nuclear uses.

Comments James W. Wambold, test engineer: "In many cases the testing of the metal or part is less difficult than the problems of organizing a tight system of control and co-ordinating the reports of the various laboratories responsible for test approvals."

Superior's policy requires: 1. All specifications and necessary tests must be entered on the order sheet before the order goes to the production department. 2. All test approvals must be received and checked off before shipping finished tubing to the customer.

The company centralized responsibility for the activity in its Mechanical Testing Group. It must: 1. Fill in original order sheets showing how tubing is to be processed and what tests are required by the customer. 2. Make the required tests for mechanical properties. 3. Expedite and release final approvals from other testing groups.

Second Step—The answers you come up with in the appraisal of your company should determine your next move: The mechanics of getting into a new technology. Four avenues are suggested: Team up with another firm. Solve a problem. Buy a business. Buy an expert.

Team Up with Another Firm

Chances of success for a revolutionary new product depend a lot on the amount of specialized talent available. Companies are finding that the risk is lessened by combining their special talents with those of other firms.

Example—Sylvania-Corning Nuclear Corp., Bayside, Long Island, N. Y., was formed last April as a jointly owned company of Sylvania Electric Products Inc. and Corning Glass Works. Its purpose: The manufacture of fuel elements. The organization brought together Sylvania's extensive experience in atomic metallurgy and Corning's leadership in ceramics, both needed for success of the new product.

In producing the new metals, chemical techniques are almost as

Missile Machining:

a New Industry

● "Perhaps 15 firms in the country are machining components for the missile industry. We're all overloaded with work. The potential is tremendous—our biggest job will be keeping pace with it."

That's the way J. H. Kauffmann, president of Diversey Engineering Co., Franklin Park, Ill., describes the missile metal machining industry. The firm, employing about 125, is the largest in the field and does a multimillion dollar volume annually.

How do you break into missile machining? Mr. Kauffmann suggests:

1. It takes contour machining equipment and the know-how to work with all the superalloys. Diversey has 44 basic pieces of equipment—grinders, jig borers, planers, boring mills, milling machines and one of the nation's largest privately owned collections of tracer lathes.

Metals commonly worked with are the high temperature, high strength alloys, including stainless steels, titanium, Inconel, Haynes Stellite and zirconium.

2. Be prepared to work with close tolerances and to provide maximum testing and inspection controls. "They're already beginning to talk about

important as metallurgical techniques. This has stimulated the formation of combines.

Example—Last December, Kennecott Copper Corp. and Allied Chemical & Dye Corp. announced plans to form an equally owned company. It will build a $40-million plant to produce titanium billets.

Allied Chemical is contributing an improved process for making the titanium tetrachloride and a new continuous process for reducing it to titanium sponge with sodium.

Kennecott's Chase Copper & Brass Co. has metallurgical experience in melting and forging titanium which will be valuable in converting sponge produced by Allied's process into billets.

Example — A few months ago Reactive Metals Inc. was formed as the jointly owned subsidiary of Mallory - Sharon Titanium Corp. and U.S. Industrial Chemicals Co., a division of National Distillers Chemicals Corp. Its purpose: To melt and fabricate zirconium metals.

Mallory-Sharon has extensive experience in melting and fabricating titanium—a close cousin to zirconium. U.S. Industrial Chemicals is just completing a zirconium sponge plant in Ashtabula, O. Reactive Metals' plant will be next door to it.

James A. Roemer, president of Mallory-Sharon Titanium Corp., (also president of Reactive Metals) describes his company's part in the venture as: "An opportunity to put the know-how we've acquired in producing titanium mill products to work in the fast growing zirconium field."

John E. Bierwirth, president of National Distillers (also chairman of Reactive Metals) describes his company's interest: "The formation of this subsidiary will avoid for zirconium 'growing pains' such as those which delayed titanium's coming of age. There are many steps between manufacture of sponge and fabrication of finished parts. Capacity for these steps must grow at the same rate to keep our sponge plant operating at full capacity."

Solve a Problem

You may find that the chance to get into the new technology comes to you because someone has a problem. Grab the opportunity. It's one of the best ways to develop a modified product or channel an existing one into the new areas. It may lead to a new product that will fit into your line.

Example — Sperry Gyroscope, Great Neck, N. Y., had a problem. Rapid increases in aircraft and missile speeds and ranges were forcing greater gear accuracy. Tolerances were steadily tightening and Sperry's manufacturing equipment was at its limit of accuracy.

It was obvious that a machine of new design had to be developed. The help of a machine tool company was needed. Barber-Coleman Co., Rockford, Ill., accepted the challenge.

Discussions lead to the decision to try the job by hobbing—with no further finishing like grinding or shaving. A co-operative program was worked out: Sperry was to check the machine during con-

millionths of an inch." Diversey has $100,000 in laboratory testing and quality control equipment and another $30,000 on order—not counting gamma or x-ray equipment and heat treating facilities which are vital in this field.

Each component must be given complete tests and inspections which are often documented with up to five or more certified copies.

3. Security clearance from the Defense department is a must. Generally, it's not difficult to obtain, but it takes time. Be sure you have a sufficient number of management personnel cleared. One company had only six of its top people cleared, then found it had a project in which several more should have sat in on the planning stage.

4. Contact work in the field will take up half the top executive's time. "Building and maintaining a reputation means a lot," says Mr. Kauffmann. "Not only must you cultivate the prime contractors, but you must be familiar with the over-all program in missiles. This means getting to know the people in the laboratories and project developmental agencies and what projects they're working on. About 20 such laboratories are responsible for the bulk of the missile development program."

One definite trend in the rapidly expanding missile field is the increasing demand for larger components. Diversey just moved into a new plant; it already has taken on a new project which will necessitate the building of an addition this fall.

struction. Barber-Coleman was to guarantee tolerances on gears which the machine would produce.

After 1½-years, the Ultracision hobbing machine came off the line. It will hob gears which would transmit angular displacement within 10 seconds—an unheard of tolerance.

Example — Hupp Aviation Co., Chicago, is now a substantial supplier of complex assemblies and parts to jet engine and accessory manufacturers because management took the attitude that no job was too tough to tackle.

Five years ago, the company was making tractor drives, harvester gears and similar commercial products. It decided it shouldn't try to compete with a number of companies in a low profit business.

A program was developed that called for overhauling manpower, machinery and management to transform the company into a precision manufacturer of aviation parts.

It was not an easy job, but it didn't require huge expenditures. Hupp decided right off to tackle the tough jobs to gain experience. It took on high temperature and close tolerance parts. It studied metallurgical and manufacturing aspects of ramjet engine production and missile fabrication. It learned how to work the new grades of stainless and latest high temperature alloys. Its designers came up with new ideas for precision gearboxes and similar parts.

Once solely a gear house, Hupp now turns out such varied products as combustion chambers, heat shields, shrouds, fuel tanks, hydraulic gear pumps, gears, spline shafts, precision gearboxes and assemblies, turbine wheels, winterization heating equipment and mobile radar vans.

A Tip—Once you develop fabrication techniques for difficult metals, spread the news. Carter C. Higgins, president, Worcester Pressed Steel Co., Worcester, Mass., makes the point in discussing his company's program on deep drawing titanium. "As a supplier of stampings, there's no point in proving our technical knowledge in this field if people do not know about it," he says.

Actually, titanium is a minor portion of the company's business, says Mr. Higgins, but experience with it and publicity about it has enabled Worcester to apply its engineering abilities in forming other difficult metals.

Buy a Business

Because several of the new technologies look so attractive for the long pull, some companies are shopping for going concerns with items already in production or ready to be made.

The executive who buys a company without a firm plan for development may be in for trouble. He should study the role which the new technology is to play in his business from financial and operating standpoints.

He should look at the people running the project to see if they are capable of carrying on; he should look at his own personnel with the view of strengthening management of the new company.

Many products for the new age are created by small research companies—they're often manned by top talent that has broken away from a large company. Generally, the little enterprise reaches a point where additional capital is needed for production equipment and expansion. This opens up the chance for a larger company to buy out or buy in.

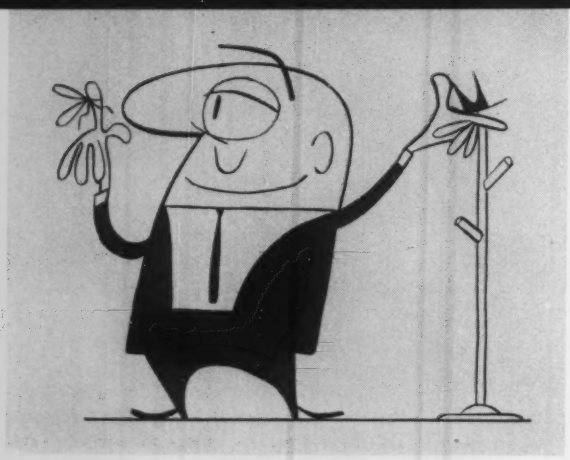
Example — Thompson Products Inc., Cleveland, known for its ability to produce highly technical products, wanted to strengthen its position in electronics. In the last three years, it has put up several million dollars to help Ramo-Wooldridge Corp., Los Angeles.

The company figured that obtaining a substantial interest in engineers Wooldridge and Ramo was the fastest and cheapest way to get into advanced electronics technology and missile guidance systems.

Buy an Expert

One of the quickest ways to expand applications for your product in new areas is to hire a man with the specific experience you lack.

Example—Carpenter Steel Co.,



How To Keep Up To Date

• Take advantage of all the help that's available. You'll want to be sure that you are keeping abreast of what's needed. Here are some suggestions:

1. Technical and Professional Meetings

They cover almost every branch of business and technology. Encourage your key men and technical specialists to attend and take part in programs. A lot of information is passed around during social hours.

2. Trade and Technical Publications

See that your men regularly read those in their fields. Here are several indexes which may help:

• *Industrial Arts Index* (H. W. Wilson Co., New York) is a monthly service which covers trade publications and technical journals by subject matter.

• *Engineering Index* (Engineering Index Inc., New York) covers electrical and mechanical engineering.

• *Transactions of the Institute of Radio Engineers* contains abstracts covering electronics and avionics.

3. Government Aid

You can get help from a number of government agencies. Many use the Government Printing Office (Superintendent of Documents, Washington 25, D.C.) as their major source of information.

• *Monthly Catalog of U.S. Government Publications* is available from the above address for $3 a year.

• *Technical News Bulletin* (Same address, $1 a year) is issued monthly by the National Bureau of Standards.

• *Nuclear Science Abstracts* (Same address, $6 a year), the AEC's Journal, is your key to unclassified reports and literature on atomic energy.

• *U.S. Government Research Reports,* an Office of Technical Services monthly publication, contains abstracts of some 300 reports on government sponsored research. A visit to your local Department of Commerce field office (OTS is a division) will reveal other sources of information.

• *Research Abstracts* of the National Advisory Committee for Aeronautics comes out weekly. It reports on aircraft and aeronautics. Source: NACA, 1512 H St. N.W., Washington 25, D.C.

• Bureau of Mines (Department of Interior, Washington, D.C.) publishes monthly a list of reports giving technical and business data on mines, minerals and metallurgy.

4. Patent Reviews

You should set up a system for periodic review of patents in your field.

• *Official Gazette of the U.S. Patent Office* is available from Superintendent of Documents at $30 a year.

5. Consultants

If you need answers to specific questions or advice on specialized fields, it's often desirable to hire a consultant.

6. Personal Contacts

One of the best ways to keep informed is to become acquainted with firms doing work in the new technologies and find out what they need.

Reading, Pa., wanted to expand its production of alloys for atomic energy use. To do this, it needed someone with atomic know-how and experience in the application of atomic materials.

Last year, Dr. Norman Groves, corrosion engineer at the Hanford, Wash., atomic energy plant, was added to the Carpenter staff. His duties: Work across the board with management to provide information needed to produce more products for atomics and advise on the development of new products.

It'll help if your expert knows the kind of facilities needed for experimental studies. Carpenter is setting up a new corrosion laboratory for Dr. Groves to use in the evaluation of alloys for atomic use. The company also expects that the lab's activities will grow and be a source of information which will be useful in producing for aircraft and missile applications.

This philosophy can be carried further.

You can bring in a top scientist and set up a division to explore new areas. Perhaps you will want to tackle the job of solving a problem that is worrying the Pentagon or the Atomic Energy Commission. Many companies have found this a good way to get a start.

Words to the Wise

Many firms that could be reaping commercial rewards from the new technology are being frightened off by the specter of highbrow sciences that can be practiced only by a chosen few.

Don't fall for that line of thinking.

In many cases a new technology is based 90 per cent on what's already established, 10 per cent or less on what's new.

With the remarkable developments that are taking place every day, shortsighted indeed is the company that tries to hold its position by standing still.

WHY IS A MAINTENANCE EXECUTIVE LIKE A GOOD HOUSEKEEPER?

Think about it and you can see they're alike in many respects. While the problems of a maintenance executive are multiplied a thousandfold, he and a good housekeeper have the same objectives – a house in order, a smoothly functioning plant. The unharrassed, relaxed individual above knows that his plant will run like the proverbial clockwork. He's learned the secret of *good plant housekeeping*. But, any maintenance executive can learn it. It's simply an individually planned Remington Rand Maintenance Control System.

That means the functions of construction, repair and *preventive* programs are performed at a realistic operation cost and with maximum equipment productivity. This is achieved by this five point plan:

1. Written Work Orders: detail for maintenance executives all conditions of jobs and work to be performed.

2. Scheduled Work: done in proper sequence with least interference to production.

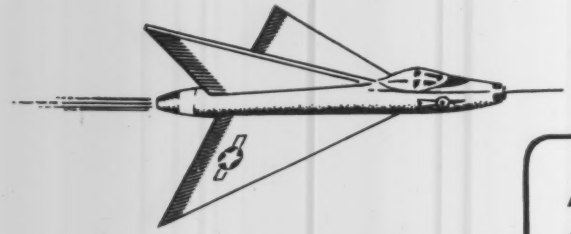
3. Equipment Records: in one centralized location, list lubrication and inspection intervals, accumulated maintenance history and costs.

4. Stores Control: provides numbering system, eliminates duplication, reduces parts investment, controls obsolescence.

5. Executive Reports: tell management at-a-glance where and when to act.

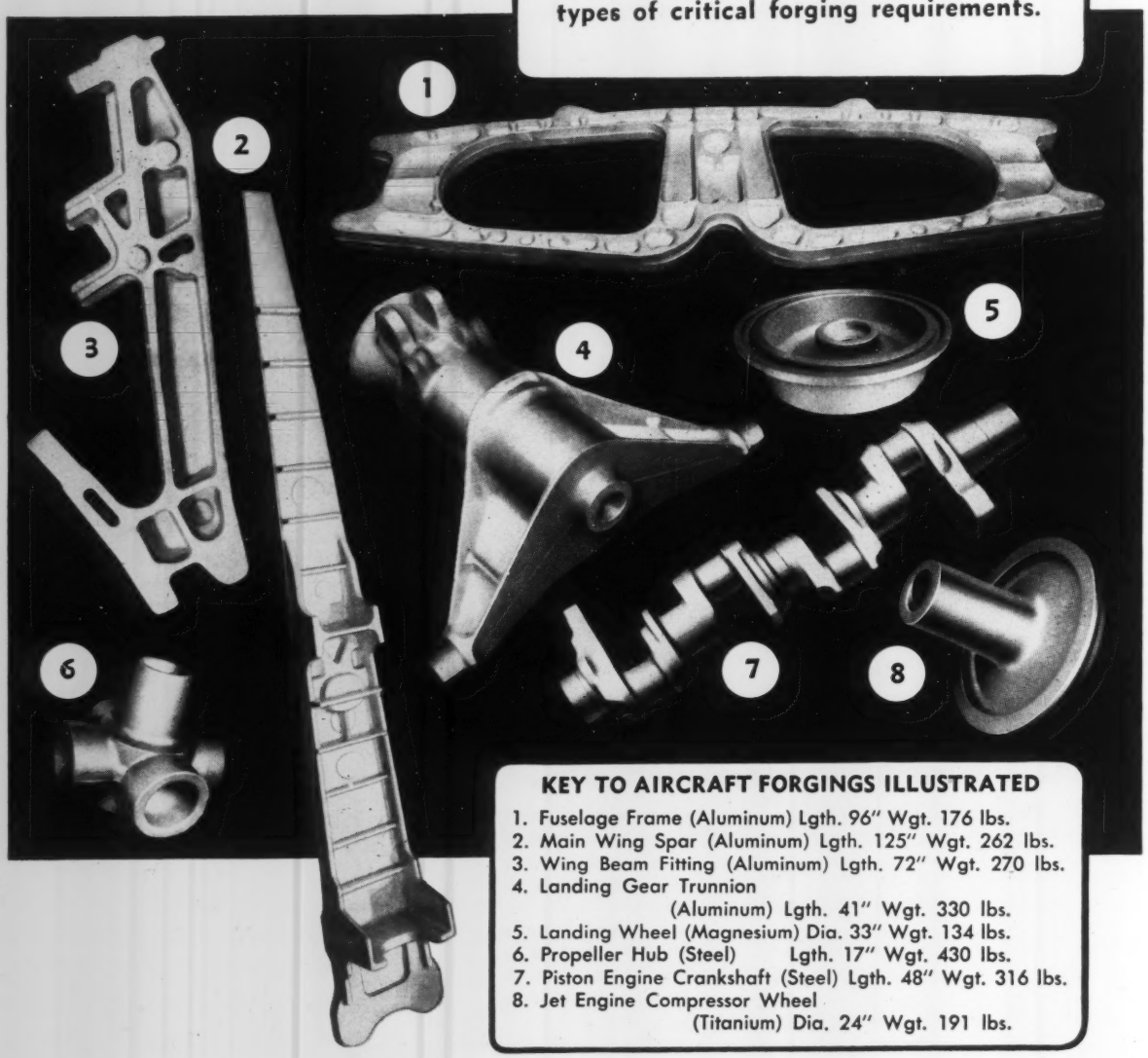
Call your nearest Remington Rand representative and discover how planned Maintenance Control establishes an effective check over your maintenance programs and provides you with all the facts for making sound decisions. Or send today for booklet X1383, Room 1832, 315 Fourth Ave., New York 10, New York.

Remington Rand
DIVISION OF SPERRY RAND CORPORATION



DEPENDABILITY...

Aviation engineers and designers since the beginning of the Aircraft Industry have relied on Wyman-Gordon for all types of critical forging requirements.



KEY TO AIRCRAFT FORGINGS ILLUSTRATED

1. Fuselage Frame (Aluminum) Lgth. 96" Wgt. 176 lbs.
2. Main Wing Spar (Aluminum) Lgth. 125" Wgt. 262 lbs.
3. Wing Beam Fitting (Aluminum) Lgth. 72" Wgt. 270 lbs.
4. Landing Gear Trunnion (Aluminum) Lgth. 41" Wgt. 330 lbs.
5. Landing Wheel (Magnesium) Dia. 33" Wgt. 134 lbs.
6. Propeller Hub (Steel) Lgth. 17" Wgt. 430 lbs.
7. Piston Engine Crankshaft (Steel) Lgth. 48" Wgt. 316 lbs.
8. Jet Engine Compressor Wheel (Titanium) Dia. 24" Wgt. 191 lbs.

WYMAN-GORDON COMPANY

Established 1883

FORGINGS OF ALUMINUM • MAGNESIUM • STEEL • TITANIUM

WORCESTER 1, MASSACHUSETTS

HARVEY, ILLINOIS • DETROIT, MICHIGAN

Technical Outlook

GAS COOLED REACTOR—It will play an important role in propulsive power for merchant ships, predicts Theodore Jarvis, director of nuclear engineering, Ford Instrument Co., a division of Sperry Rand Corp., New York. When operated with a closed cycle turbine, it should offer advantages of safety, economy, simplicity and compactness, he says. The principle of operation is based on the use of an inert gas under pressure for direct transfer of energy from the reactor to the turbine. No heat exchanger and secondary loop are involved as in the pressurized water reactor.

TITANIUM PICKLING—Tests by Rem-Cru Titanium Inc., Midland, Pa., show that the nitric acid content of pickling baths (between 0 and 30 per cent) has little effect on the hydrogen pickup of some titanium alloys. It suggests that pickling may be speeded up by using baths containing more hydrofluoric acid and less nitric for the alpha and near-alpha types.

MORE ON TITANIUM— Electro Metallurgical Co., a division of Union Carbide Corp., New York, announces master alloy formulations that permit the production of titanium-base alloys without other additives. The company says this helps the melter by speeding up formulation and mixing, eliminating problems in raw material storage and allowing use of semi-skilled labor.

THIN GAGE METALS— American Silver Co., Flushing, N. Y., is precision rolling phosphor bronze to a thickness of 0.0005 in., with tolerance of ±0.0001 in. It will be used in miniaturized current carrying springs, thermostat controls, bushings, shims and electronic computing tape. Allied Products Division, Hamilton Watch Co., Lancaster, Pa., is rolling Alfenol strip to 0.025 in. and hopes to get down to 0.0005 in. The soft magnetic material (16 per cent Al-84 Fe) was developed in 1953 by the Naval Ordnance Laboratory. It combines high permeability with wear resistance and is especially suitable where wear is a problem.

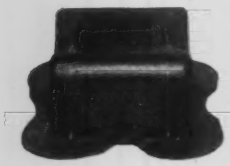
FIRE SAFE CLOTH— Fiberfrax, a ceramic fiber made by the Carborundum Co., Niagara Falls, N. Y., from aluminum silicates, is now available as roving, yarn, cord, rope, woven tape, broadwoven fabrics and other textile forms. The heat resistant material withstands temperatures up to 2000° F and is an excellent thermal insulator. It is being used in flame barriers, gaskets, protective clothing and conveyor belts.

FREE PISTON OIL—When and if the free piston engine makes its debut in the automobile world, there will be a lubricating oil waiting for it, say engineers at Shell Oil Co., New York. The oil (Shell Free Piston Engine Oil) has been tested exhaustively on large free piston engines operating in Europe. It will be used for six free piston gasifiers being built by Cleveland Diesel Engine Division of General Motors Corp. to power a converted Liberty ship. The detergent oil has high load-carrying ability and minimizes ring and cylinder scuffing and scoring.

NYLON SCREWS— They are made in ⅜ to 1 in. lengths by Gries Reproducer Corp., New Rochelle, N. Y. Natural resilience allows them to be used in an interference fit, which makes it possible to get a tight, vibration-proof assembly without lock washers, claims the company. The material is insulating, nonmagnetic, nontoxic, fungus-proof, warm to the touch and will retain its shape after sterilization.

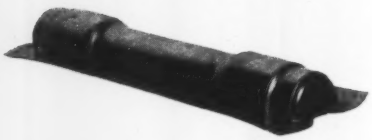
Metalworking Outlook—p. 67 Market Outlook—p. 169

Hydroform Tool Costs Rarely Exceed $1000



$650 tool cost to form cold-rolled steel 8 x 8 x 5 in. deep in one operation. Estimated conventional die cost: $7000

$700 tool cost to form stainless steel 12 in. in diameter, 3 in. deep in one operation. Estimated conventional die cost: $4200



$500 tool cost to form aluminum 17 x 2¾ x 2¾-in. in one operation. Estimated conventional die cost: $3000

$650 tool cost to form aluminum 10 in. in diameter, 5 in. deep with embossing in one operation. Estimated conventional die cost: $7000

$800 tool cost to form aluminum 5½ x 5½ x 6½-in. deep in two operations. Estimated conventional die cost: $5000

$600 tool cost to form ⅝-in. cold-rolled plate 14 in. in diameter, 7 in. deep in one operation. Estimated conventional die cost: $6000

Complex Shapes at Bargain Rates

WHEN low quantities are involved, Hydroforming offers cost cutting possibilities in making complex shapes from sheets and plates.

Chief advantages: Inexpensive tooling, minimum lead time to produce tooling, versatility in forming complex shapes and contours, minimum thinning out of metal, no marring of surface finishes.

How It Works—Hydroforming differs from conventional press forming in that the conventional female die is replaced with a flexible diaphragm that seals off a pressure chamber filled with hydraulic fluid (see sketch page 126).

Tooling usually consists of a punch, shaped to the form of the part, and a draw ring or blank holder to fit the outline of the punch. Die cost generally is less than 50 per cent that of conventional press tooling.

Oil-hardened steel, cast iron or tool steel can be used for punches. In some cases, Kirksite, plastics, brass, aluminum or hardwood can be used. There is no abrasion of the punch because the controlled

$700 tool cost to form 3/8-in. Inconel 17 in. in diameter, 7 in. deep in two operations. Estimated conventional die cost: $9000

$600 tool cost to form stainless steel 8 x 5 x 3 in. deep in one operation. Estimated conventional die cost: $5000

$600 tool cost to form stainless steel 11 in. in diameter, 6 in. deep in one operation. Estimated conventional die cost: $8000

$175 tool cost to form 5/16-in. cold rolled steel 6½-in. in diameter, 3 in. deep in one operation. Conventional die cost: About $3000

$400 tool cost to form copper 16 in. in diameter, 3½-in. deep in one operation. Estimated conventional die cost: $2000

$400 tool cost to form stainless steel 3 in. in diameter, 6 in. deep in two operations. It is impractical to deep draw part

Big advantage of the Hydroform press is inexpensive tooling. On one Inconel part, formed in two operations, the saving over conventional press tooling was $8300

hydraulic pressure on top of the diaphragm literally wraps the metal around the punch.

Properties — The rubber diaphragm prevents rapid application of strain at any point of the metal. The pressure on the rubber locks the metal to the punch radius and distributes the metal uniformly on the punch surface.

Elongations are localized and can be greater, without undue thinning out of the metal, than where elongation strain is spread along the entire side of a part.

Controlled uniform pressure holding the metal against the punch prevents successive strain concentrations at the punch radius regardless of the depth of draw. Parts can be drawn deeply with nearly uniform thickness. This can cut down the number of operations needed to reach the deformation limits of the material.

Flexibility—"Because there is no metal-to-metal contact, it is possible to form parts which could not be done conventionally, regardless of costs," says Col. Herman Lacy,

The six steps in the Hydroform operating cycle:

1. Blank is placed on the draw ring.

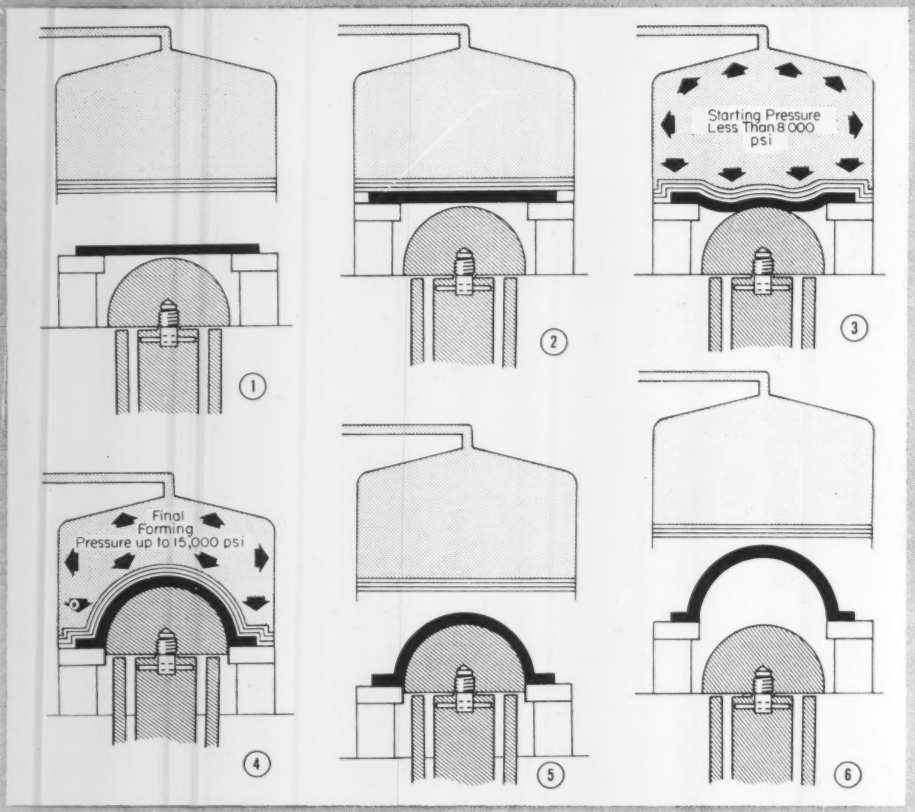
2. Dome is lowered, clamping blank to holder.

3. Starting pressure is applied to force blank against punch.

4. Punch moves upward increasing pressure and forming part.

5. Pressure is released and dome is raised.

6. Work is stripped from the punch.



president of Hydroforming Co. of America, Chicago.

The jobbing firm has formed sandwiches of different materials. On one part, glass fiber was sandwiched between two sheets of steel and formed. The materials were not bonded before forming.

Copper-clad steel is formed on a Hydroform press for an eastern cooking utensil manufacturer. Plastic coated to aluminum forms easily without damage.

Materials—The company has worked with practically all ductile materials, including stainless, Inconel, aluminum, copper, brass, titanium, Nimonic 75, clad metals and plastics. The material used determines the maximum blank thickness, which ranges from foil to $\frac{5}{8}$-in. mild steel.

The hydraulic system of the Hydroform press provides up to 10,000 psi in the dome. The movement of the piston into the pressure chamber can increase the pressure to 15,000 psi.

Most shapes can be formed in one operation. Diameters can be held within 0.003 in. and heights to 0.005 in. Minimum radiuses depend on material thickness. Generally, internal radiuses should be at least 0.095 in. and external radiuses not less than 0.125 in.

More than one forming operation may be required to make a part. Complex shapes or metal characteristics may require two or more dies or punches. Pressure and time are the control factors in obtaining the proper metal flow. Some metals must be annealed between operations because of work hardening.

Other Operations — Edging or sharpening of the radius betweeen the flange and the wall of the part can be done automatically as part of the forming cycle. Flexible female-die drawing methods can be used to blank or pierce holes in the bottom of a cup with a piloted plug. The material also can be trimmed during forming.

"Hydroforming is not intended to compete with conventional stamping and drawing," says Colonel Lacy. "It is filling a definite gap in metalworking where small numbers of parts are needed—from 2 to 1500 a month—at lowest possible cost. One other factor contributing to cost saving is that the method is frequently used in combination with other types of forming. For example, we're forming a $\frac{3}{8}$-in. Inconel part which is finished by spinning."

Hydroforming Co. of America has five Hydroform presses made by Cincinnati Milling Machine Co., Cincinnati.

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* *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

A foreman is checking with the control room operator to find out when a part will arrive in his department. You can see a portion of the control boards in the background

Visual Production Control

Paper work normally used is eliminated by this system. The foreman now has more time to devote to supervision of the work as it progresses through the shop

YOU will be interested in this visual system if you are having difficulty keeping close control on production and job location in the shop, predicting job completion dates and preventing intershift confusion.

Cleco Division of Reed Roller Bit Co., Houston, uses the system to organize the production of 5000 parts for 300 Cleco portable air tools and accessories.

"It is designed for job lot production and is not intended for assembly line or conveyor line production," says S. E. Rees, production manager at Cleco.

Centralized Room — The nerve center is a room which opens into the approximate center of the factory, making it convenient to the production control people and to each departmental foreman.

An order from the scheduling section goes directly to the control room where it is scheduled for each successive operation and department including date order requested, processed and issued.

It is placed on one of the boards (each tool has its own area) and is identified by a part number. Following the part number, each operation required is shown in sequence and coded by operation number and color to indicate the department in which the operation is to be performed.

Each department has one color which means each department foreman is concerned with only his particular color. A clip is placed on the particular operation indicating that it is being performed and is moved by operation as the job progresses.

Checked by Foreman — Every morning and during the day as information is required, each production foreman goes to the control room and examines the boards to see what orders are due in his department and their production priority.

A flagging system indicates priority. A red flag stands for delivery within 60 days; a yellow diagonal stripe, delivery within 30 days; a white flag with a red ball, a rush order.

Twice each day a report is made on each order and operation completed by each department. When a foreman finds a clip has been placed on his departmental color, he knows the parts are ready for processing in his department.

He goes to his department where a box contains a traveler, giving all the necessary information to do the work.

Travelers move with the parts and are placed in each foreman's box by the material mover.

A production control card which is part of the traveler checks the piece count and the production of bad and good pieces throughout the entire process.

No Written Orders—This system eliminates written production orders. The foreman can schedule production in his department with a full picture in front of him.

He can easily determine the work that is coming down the line to him. Since he is freed of paper and office work, he can spend more time on the floor supervising the operations.

Predicts Production — The date of completion for delivery can be predicted accurately since the status of each part in process is readily available.

Cleco is now operating with work-in-process inventory of less than one and one-half months.

Advantages—The system provides a close control on the status of production. The number of hours of work necessary for expediting is greatly reduced.

Lost time and idle time are reduced by providing the foreman with advance information in work scheduling, as well as tooling scheduling.

Intershift confusion and scheduling problems are eliminated because each shift foreman has his work scheduled for him on the board.

Anyone can see, at any time, the exact location of parts for all the orders in process in the shop.

Chemical or electrolytic corrosion can ruin underground piping systems in a short time. You can protect yourself against such losses with an electrical system. Here's how one firm did it

Case History on Cathodic

MAINTENANCE men at the International Harvester plant, Louisville, found a leak at the welded joint in a gas main that had been in service only a few years.

When examined, the weld looked half finished—only a root pass remained. The installing contractor repaired the pipe.

A few months later, several leaks were found in water mains, gas lines and other underground systems. Again, the welded joints looked half finished. Burial in concrete didn't help.

Harold Garceau, International Harvester's plant manager, verified a suspicion that soil condition was the problem — galvanized fence posts rusted through in a few months. (Cast or black iron pipes normally last from 15 to 20 years underground.)

A cathodic protection system was installed more than a year ago. Since then, there have been no leaks in any of the pipes or underground tanks.

Kinds of Corrosion — If the underground pipes around your plant spring leaks every year or two accelerated corrosion may be the reason. Basically, there are two kinds: Electrolytic and galvanic.

Electrolytic corrosion is often referred to as stray-current corrosion and is caused by neighboring sources of direct current like railways or machinery. Galvanic corrosion is caused by the reaction between the metal structure and chemicals (like those in soil) which surround it.

In electrolytic corrosion, the electrical current causes the corrosion. Of the two types, galvanic is more common.

Wherever electric current leaves a pipe and enters the soil, it takes particles of metal with it. Leaks develop when the current is appreciable or is concentrated in a small area. You can lose up to 20 lb of metal a year from a current of 1 ampere.

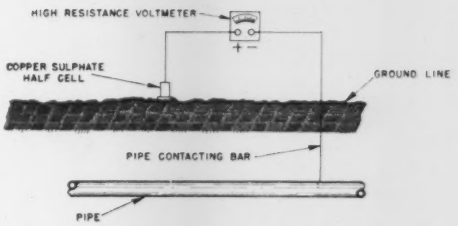
You can stop corrosion if you can prevent current leaving the pipe—apply enough direct current in the opposite direction to that of the galvanic current.

Protection—One of the more traditional ways to combat galvanic corrosion is to bury magnesium anodes a short distance from the pipe or structure and connect them to the pipe with a copper cable. Another method uses a graphite anode connected to the metal structure through a source of direct current.

If such systems are to operate

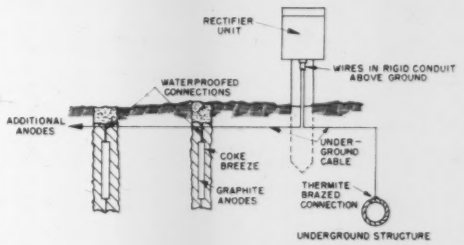
Protection

Measuring Soil Resistance



Here's a reliable way to measure soil resistance. Four electrodes are connected to a power source. Current and voltage are measured and resistance calculated by formula

Connection to Power Source



This is the way anodes and underground structures are connected to an electrical power source. Coke breeze surrounds graphite anodes

effectively, all underground metal structures must behave as a single, continuous electrical network. All sections are interconnected.

To protect its 132 acres, the Louisville plant required six anode systems energized by rectifiers. Here are some details of the installation:

Each anode system (called a ground bed) contains 11 to 34 anodes. Rectifier capacities are 24 or 36 volts. Current is 20 to 50 amperes.

Anodes are installed in 9 in. holes which are 9 ft deep and well tamped with a prepared coke breeze. They are connected to the positive terminal of the rectifier through a copper cable.

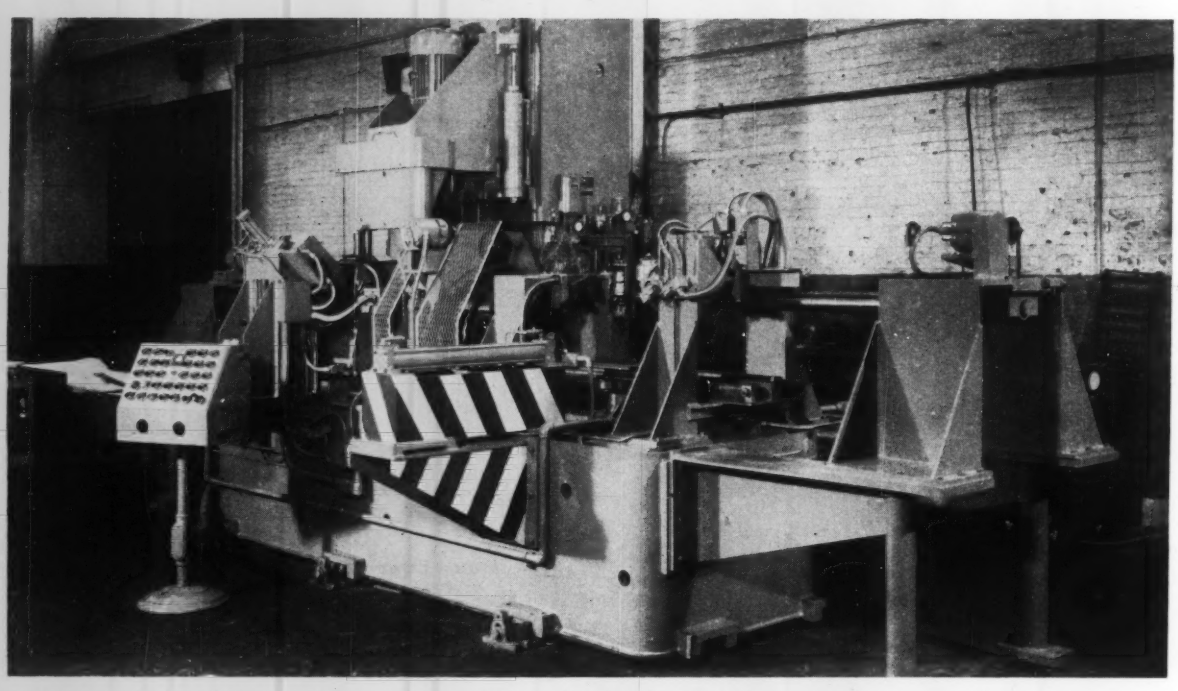
Testing — The first step of installation is to determine soil resistivity. The four-pin method was used at International Harvester (see illustration). All underground pipes (including those of adjacent utility firms) were located and plotted with a Fisher M-scope pipe locator. Pipe-to-soil potentials were measured to define the corrosion patern. A test current was applied to simulate cathodic protection.

Harco Corp., Cleveland, made the installation. Its engineers based the design on field test results. After the ground beds and rectifiers were installed, they did tests on the electrical conductivity of underground structures. Voltage or potential between the structure and ground was measured with the rectifier on and off. If the structure became less negative when the rectifier was turned on, additional bonding was needed. If the structure became more negative when the rectifier was turned on, no additional bonding was required.

The installation of such systems can affect pipes or cables of corrosion-proof metals like lead. Engineers checked those that were nearby. Any that were exposed to damage were electrically connected to the protection system.

Maintenance—Systems like the one at International Harvester are energized by selenium rectifiers and require little care. Maintenance men check panel meters at each rectifier once a month. Settings and readings are determined by engineers during final adjustment. Each rectifier has adjustment taps which permit correction of voltage readings.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*



Automatic cylinder block inspection machine. Stripes identify ejection station

Machine Culls Out Bad Cylinder Blocks

Finding proper centers to bore the cylinders in cast iron blocks is one function of the automatic inspection unit. It also sorts out rejects before they're machined

CADILLAC Division of General Motors Corp. expects to drastically cut material waste in the machining of cylinder blocks with a new automatic inspection machine.

Shifting mold parts cause slight variations in the cast iron blocks during casting. Often, when the cylinders are bored out, the boring tool is not properly centered. Result: The wall thickness of the water jacket around the bore is thin on one side and thick on the other.

This condition isn't discovered until the block is completely machined. Then it has to be thrown away as a reject.

Machine Inspects Block—Baker Bros. Inc., Toledo, O., developed a machine that inspects the block and sets up a reference point so that all cylinders can be bored with equal wall thicknesses.

If it is not possible to locate the blocks so the bores can all be made on proper centers, the block is ejected from the machine and painted to identify it as a reject.

The inspection unit is one of the early operations on the block so the bad parts can be culled out before machining is done.

Operation—Cylinder blocks are fed into the unit at the left end on a conveyor. In the machine, the parts are automatically moved into the first station where two electronic probes reach into the block and feel the position of the cylinder walls. The probes are connected to a computer which moves the block back and forth to find the position where the wall thickness will be the same all the way around on the eight cylinders.

If that point can be established within the limits required, two holes are drilled and reamed in the block to serve as the reference point from which cylinders are finally bored.

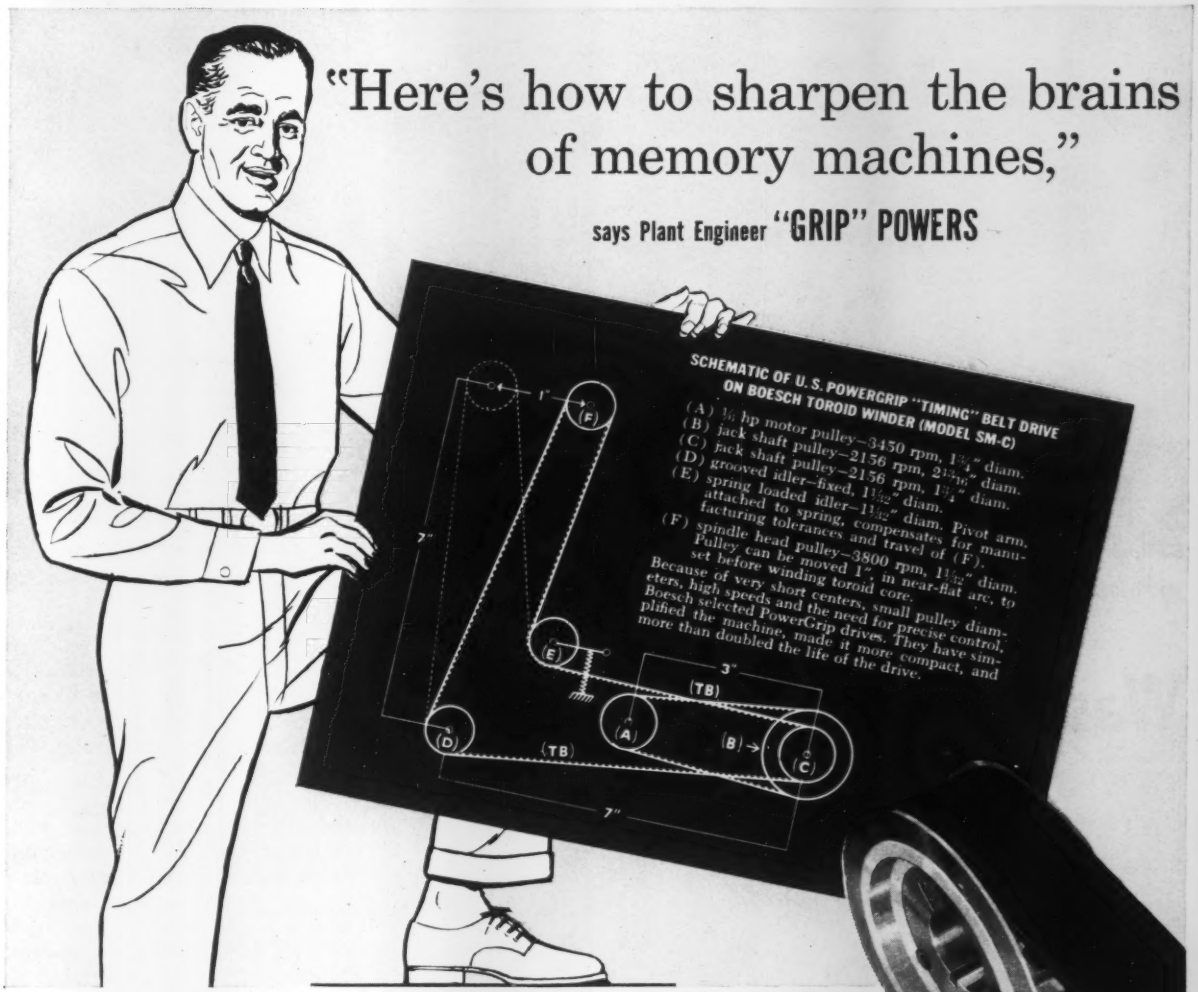
When the holes are drilled, the block is moved to a turnover station. This is necessary because the next machining operation is done from the top while the locating operation must be done from the bottom.

Reject Station—Ejection of bad blocks is done at the third station. The part is pushed onto a turntable which turns at right angles to the machine. Then it is pushed out onto a second conveyor where it is automatically sprayed with paint.

PowerGrip "TIMING" BELTS

"Here's how to sharpen the brains of memory machines,"

says Plant Engineer "GRIP" POWERS


SCHEMATIC OF U.S. POWERGRIP "TIMING" BELT DRIVE
ON BOESCH TOROID WINDER (MODEL SM-C)
(A) ⅓ hp motor pulley—3450 rpm, 1¾" diam.
(B) jack shaft pulley—2156 rpm, 2¹³⁄₁₆" diam.
(C) jack shaft pulley—2156 rpm, 1¾" diam.
(D) grooved idler—fixed, 1¹⁵⁄₃₂" diam.
(E) spring loaded idler—1¹⁵⁄₃₂" diam. Pivot arm, attached to spring, compensates for manufacturing tolerances and travel of (F).
(F) spindle head pulley—3800 rpm, 1¹³⁄₃₂" diam. Pulley can be moved 1", in near-flat arc, to set before winding toroid core.
Because of very short centers, small pulley diameters, high speeds and the need for precise control, Boesch selected PowerGrip drives. They have simplified the machine, made it more compact, and more than doubled the life of the drive.
1"
7"
3"
(TB)
(TB)
(A)
(B)
(C)
(D)
(E)
(F)

The "brains" of electronic memory machines are centered in toroids—tiny, doughnut-shaped coils of thousands of turns of tightly wound wire. Winding these toroids requires the utmost precision. That's why Boesch Mfg. Co. (Danbury, Conn.), a leading maker of toroid winders, uses U.S. PowerGrip "Timing"® Belts on their power transmission drives.

U.S. PowerGrip "Timing" Belts have an efficiency of close to 100%. The belts need no lubrication, no maintenance, are more accurate and quieter than drives formerly used and far safer to both operator and machine.

Says the chief engineer of Boesch: "We also use U.S. PowerGrip on our toroidal tape winders and bobbin winding machines. Our engineers and 'U.S.' engineers work hand in hand on *all* our wind-up problems involving power transmission."

A complete line of PowerGrip "Timing" Belt drives—plus expert power transmission engineering assistance—is obtainable at any of the 28 "U.S." District Sales Offices, at selected distributors, or write U.S. Rubber, Mechanical Goods Div., Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Co. Ltd.

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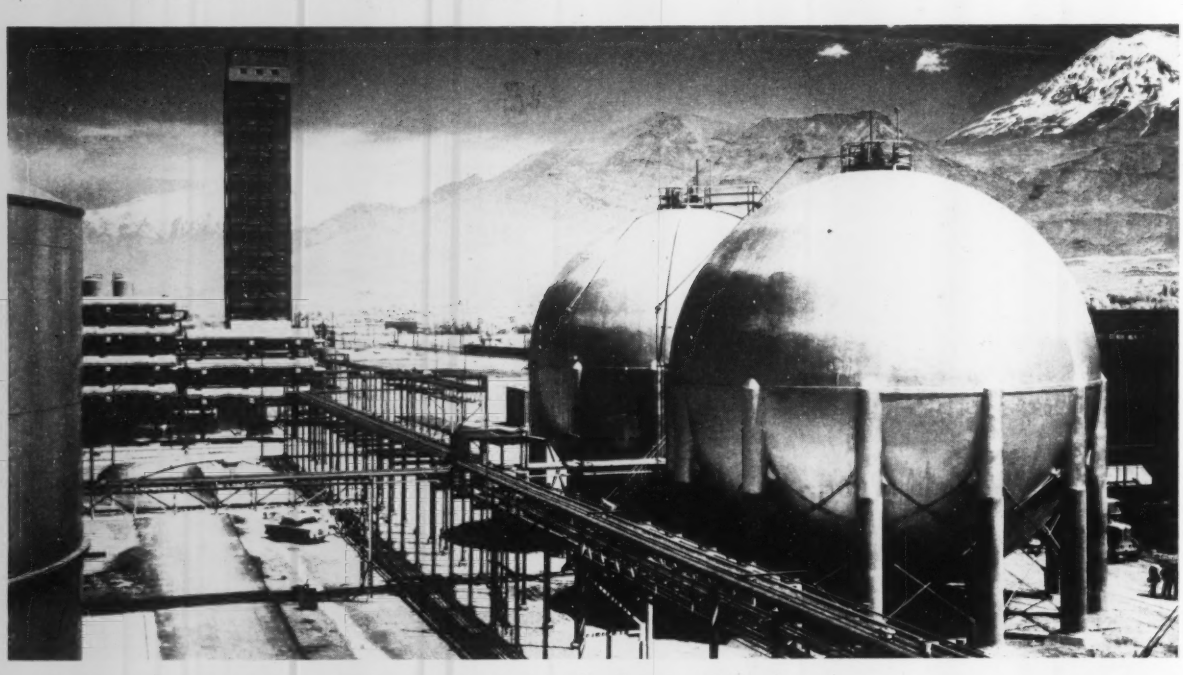


In this by-product recovery plant at U. S. Steel's Geneva Works . . .

Waste Gases Turn a Profit

Hydrogen from coke oven gas is combined with nitrogen from the oxygen plant to make ammonia, nitric acid and high strength, ammonium nitrate fertilizer

UPGRADING of coke oven by-products has taken a new turn at U.S. Steel Corp.'s Geneva Works, Provo, Utah. Hydrogen from coke oven gas and nitrogen from the air are being combined to produce anhydrous ammonia. The ammonia, in turn, is converted into nitric acid or fertilizers, or sold. (See STEEL, May 13, p. 128.)

The synthesis plant, constructed by Blaw-Knox Co.'s Chemical Plants Division, Pittsburgh, uses the Mortecatini process for gas purification, ammonia synthesis and nitric acid production.

Raw Materials—Geneva's four batteries of 252 coke ovens furnish the coke oven gas, which is 50 per cent hydrogen by volume. The hydrogen is stripped from the gas in a compressing and cooling sequence which also removes impurities such as hydrogen sulphide and carbon dioxide. The remaining gas is piped to the open hearth, where it is actually a better fuel than before (the Btu content of hydrogen is low).

Nitrogen enters the process as a by-product from the steel plant's oxygen plant. It is mixed with hydrogen to form a synthesis gas.

Synthesis—Compressed to high pressure at high temperature in the presence of a catalyst, the synthesis gas is converted to ammonia. This is piped as a liquid to two, 2100-ton Hortonsphere tanks.

Part of the ammonia is shipped to customers. The rest is piped to the nitric acid facility, where, as a gas, it is mixed with air and burned in the presence of a platinum catalyst. The resulting nitrogen dioxide is bubbled through water in 20 stainless steel cascade absorbers where it combines with water to form 53 per cent nitric acid.

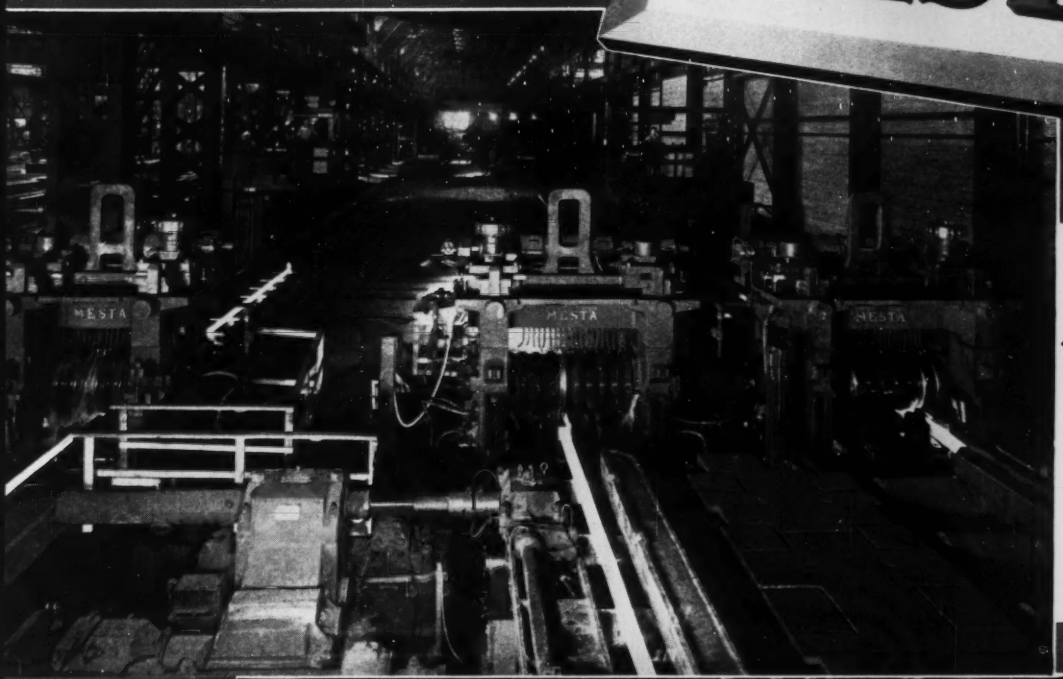
Fertilizer—Nitric acid not sold or used is mixed with ammonia to form an ammonium nitrate solution. Some of this is sold in liquid form, but much is "prilled."

Prilling is a method of producing ammonium nitrate in granules. The liquid is piped to the top of a 13-story tower and dropped in a fine spray. The drops solidify during their fall and are later dried and coated with diatomaceous earth to prevent caking. The product is bagged and sold as high grade fertilizer (it contains 33.5 per cent nitrogen).

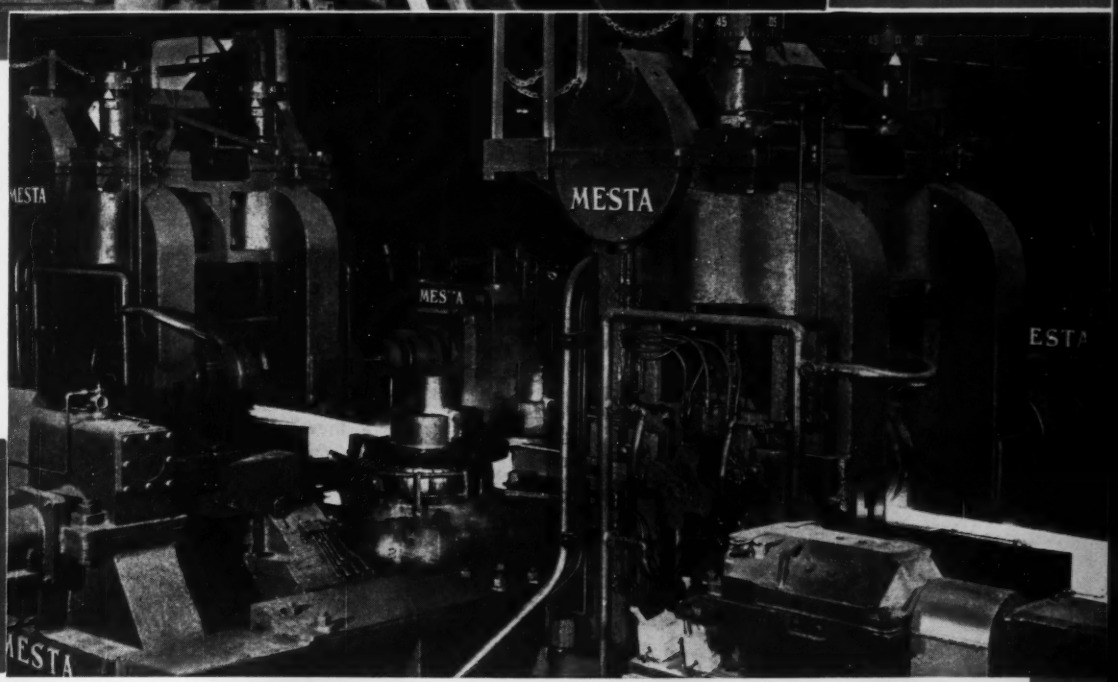
The $18-million ammonia product plant supplements the coal chemical recovery facility which has been operating at the Geneva Works since 1944. It produces ammonium sulphate fertilizer and toluene, benzene, coal tar and other chemicals. Operating costs of ammonia synthesis at the newest plant are expected to be 10 to 15 per cent below those of other methods.

BAR and BILLET Mills

Designed and Built by MESTA



Intermediate, Leader, and Finishing Stands of a MESTA 32" Bar Mill



Two stands of a MESTA 30" Two-High Continuous Billet Mill with Vertical Edger

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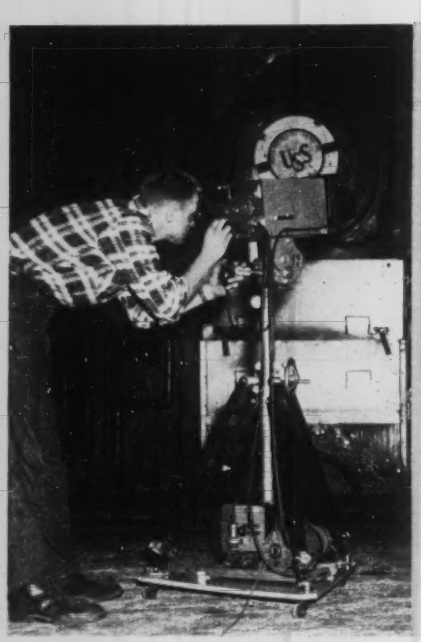
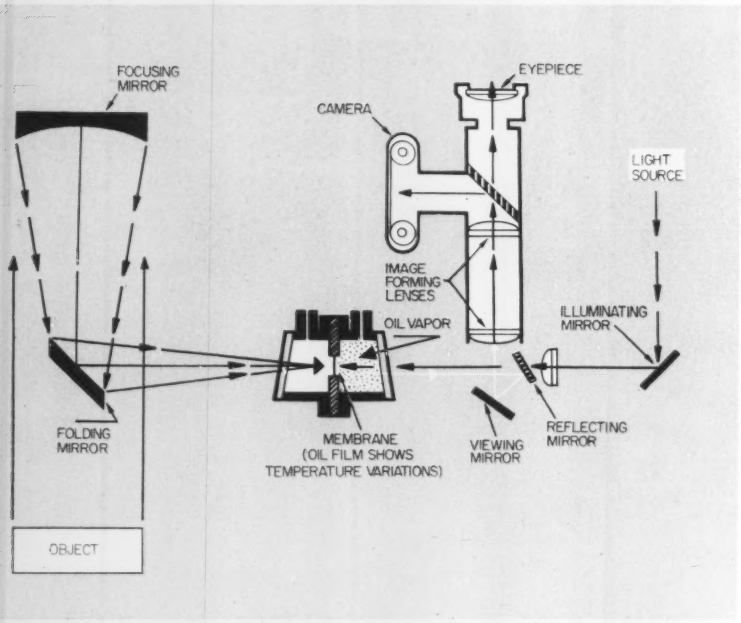




An Evaporograph is used to study the condition of the bearings of a roll. Diagram shows the components of the instrument

New Way To Find Hot Spots

Evaporograph uses radiation differences to make two-dimensional heat picture. It does not require physical contact with the object. Permanent record is recorded by built-in camera

AN INSTRUMENT sensitive to changes in temperature (less than 2°F) at 3 miles is being used by U.S. Steel Corp. to detect hot spots inside equipment from the "outside."

Called the Evaporograph, the instrument developed by Baird-Atomic Inc., Cambridge, Mass., uses the condensation of oil molecules on a sensitive membrane to picture the intensity of infrared radiation.

Uses—Hot spots caused by the improper arrangement of burners in blast furnaces can be detected before any significant damage is done. It shows the temperature distribution pattern to aid in furnace design.

The instrument is portable and can be used for spot checks throughout the plant. It does not require scaffolding or physical contact with the area under study. Blast furnace stacks are checked from the ground level.

Worn areas can be detected in machinery, steam lines and mill equipment where temperature is a measure of the interior conditions.

Vaporizing Cell—The heart of the evaporograph is a membrane. Made of nitrocellulose 4 millionths of an inch thick, it is mounted on a metal ring.

Air is evacuated from the cell, and the rear half is heated slightly to increase the vapor pressure of the oil. Just as water will condense on a cold glass in hot weather, the oil starts to condense on the nitrocellulose.

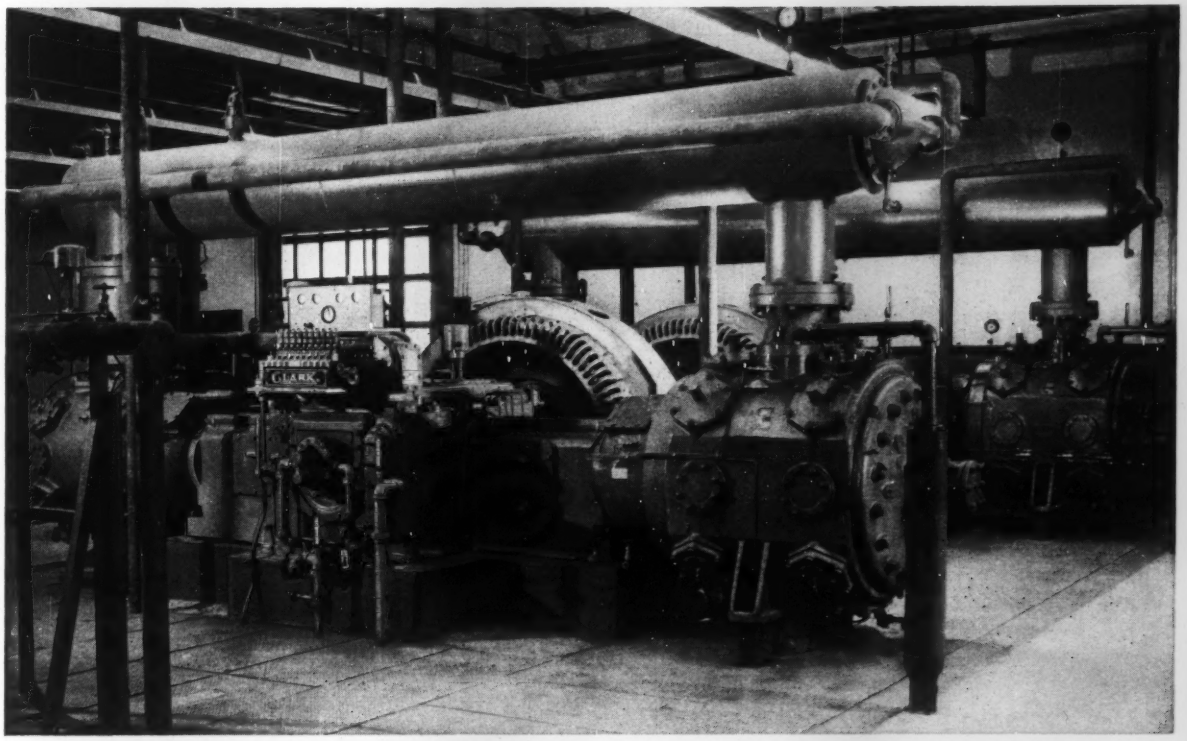
The image of the object under study is focused on the film. Portions of it will be at different temperatures because of variations in the infrared radiations.

More oil condenses on the cooler portions of the membrane. Each temperature-differential area has a different interference color resulting from the variable film thickness.

Two Methods — Photographic: The change in film thickness in a given time is measured by making a density scan of the pictures. Visual: Times are measured for a given thickness change as indicated by the change from one color to another. Blue and yellow are the easiest and most definite to observe since the changes are rapid.

Unknown temperatures are measured by using a reference temperature in the field of view.

Time — Temperature differences affect the time required to form an image. For example, the image of a man at room temperature (difference of 30°F) may require 15 seconds, while a hot soldering iron (difference of 600°F) will require only a fraction of a second.



What Jules Verne couldn't foresee!

Around the world, 24,325 miles of it, in 45 hours and 19 minutes... our strategic B-52 bombers did it non-stop! This speedy trip made Jules Verne's "80 days" seem like a lifetime. Part of the B-52 – the electrical pneumatic units that drive generators to provide the muscle for operating flaps, gun turrets, radar and countless other operations are provided by Thompson Products, Inc. of Cleveland, Ohio. Four of these 205 horsepower units go into every B-52. To be certain they are perfect, Thompson gives them a thorough test before shipment. One 350 horsepower Clark CMA-4 and two Clark 600 horsepower CRA-2 air compressors furnish the air for testing.

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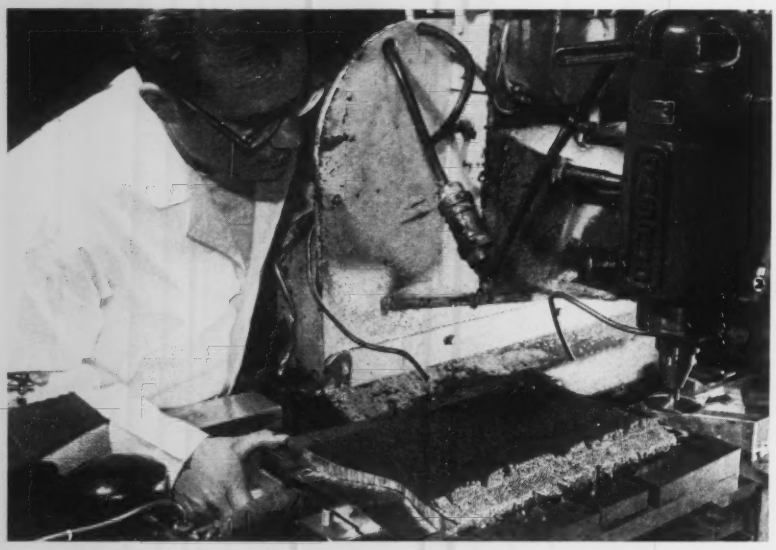

Fragile metal honeycomb machines as easily as steel when filled with water and quick frozen. The circular tool operates like a butcher's meat slicing machine

Northrop Freezes Honeycombs

It keeps the cores from collapsing during machining. A freezing unit is mounted on a milling machine. The thin cutter puts in bevels, slots, concave or convex shapes

THE AIRCRAFT industry is serious about its role as machining innovator. It's pioneering in numerical controls; it's knee deep in throwaway cutting tools; and it's experimenting with frozen workpieces (STEEL, Aug. 5, page 93). Example: Supporting flimsy honeycomb cores with ice.

Walls of the cores are tissue thin—will quickly crumble under almost any cut. At Northrop Aircraft Inc., Hawthorne, Calif., production men have coupled a refrigeration unit to a standard milling machine. Water is poured into the cores, quickly frozen, and the core is easily sliced or contoured.

Look for the technique to spread to other nonrigid workpieces. One manufacturer is toying with the idea of using ice to back up thin-walled aluminum diecastings.

Challenge

Most aircraft spokesmen have expressed concern about the impact of high-temperature materials on production methods. H. B. Sipple and G. G. Wald, engineers at Lockheed Aircraft Corp., Burbank, Calif., have this to say: "It may be necessary to expand the machine tool requirements in our industry by as much as four to ten times to accommodate the production of heat-resistant airframes, at the rate of production for current airplanes. This points out the necessity for improvement in machining characteristics of materials and the vigorous exploration of new techniques for metal removal, including chemical and electrochemical processes."

Depreciation Reform

Overhaul of Bulletin F provisions for depreciation write-off may be more thorough than predicted. Reason: The Internal Revenue Service has received volumes of replies to its invitation for industry comments and suggestions.

More Basic Refractories

Plant expansions will increase Kaiser's ability to supply a fast growing market

HERE'S EVIDENCE of fast growth in the use of basic refractories: Kaiser Chemicals Division of Kaiser Aluminum & Chemical Corp. has raised its production capacity again.

This time it's a 50 per cent increase for the Columbiana, O., plant, not yet two years old, and a bigger boost for the Moss Landing, Calif., seawater plant. The Columbiana plant makes fused and chemically bonded shapes and grain. The Moss Landing plant makes periclase, a constituent of basic refractories.

Completion of the current $3-million expansion program raises Kaiser's capacity to produce brick and ramming mixes to more than twice its 1955 limit.

New Equipment — The Moss Landing plant has added facilities for handling seawater and a third rotary kiln. They increase the plant's magnesia products capacity from 150 tons to 375 tons per day. Additions at Columbiana include pressing and handling equipment.

Other major refractory facilities of the company are a brick plant adjacent to the seawater plant at Moss Landing and a research plant at Milpitas, Calif. Calcined dolomite from the Kaiser quarries at Natividad, Calif., is reacted with seawater at Moss Landing to make magnesia products (including periclase).

New reactors at Moss Landing

JONES & LAMSON MACHINE COMPANY

the man who needs a new machine tool is already paying for it

Blessed Event, Plant-Style

They're passing out cigars in the front office. And here on the delivery platform, the production V.P. is on hand personally to welcome the new arrival . . . a J & L Turret Lathe.

Beaming grins like his can be seen throughout the plant, and with good reason: everyone figures to benefit from this new equipment. The operator's job is made easier, and his opportunities for increased compensation are better. Production management can start right away on those new production estimates, and begin planning further improvements. Top management knows that the competitive position of the company is stronger. And right down the line, that profit-sharing plan looks sweeter than ever.

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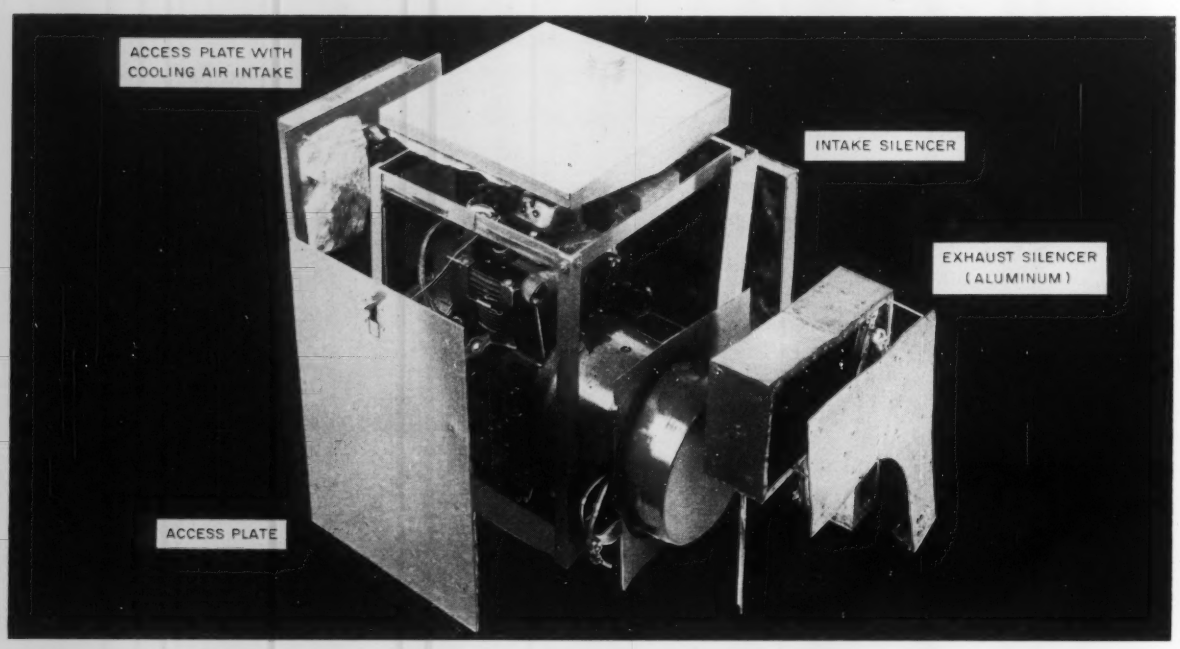

Enclosure around this gasoline motor generator is a good example of shop produced noise control. Small, noisy machines like this one can usually be handled as a single unit

How To Control Plant Noises

They are traced to five causes. This article outlines general approaches you can use for detection and control. Abatement program can be part of your regular safety efforts

NOISE in the commercial screw department at the Chicago plant of Western Electric Co. exceeded safe levels.

Process engineers solved it by applying sound absorbent (acoustical) tile to walls and ceilings. The cost: $40,000.

Planned Program—A. M. Wagner, superintendent of process development, says that sound control is a part of regular safety activities. "We know that excessive noise contributes to hearing losses. Compared with results, an investment in noise abatement is peanuts."

Control—Four basic routes of attack are open: 1. Reduce noise at its source. 2. Change the path sounds travel from source to ear. 3. Absorb it. 4. Move the source.

Here are some facts about noise and its control from Armour Research Foundation of Illinois Institute of Technology, Chicago:

Sources — Noise is caused by such things as: Impact (gear teeth, piston hitting cylinder head, hammers); friction; air turbulence (air nozzles are a common source); forced vibrations (like those from unbalanced shafts); and magnetic hum (from transformers, for example).

A gear makes two kinds of noise —rubbing and striking. Noise travels through the gear hub, shaft, bearings, frame and housing. They, in turn, radiate additional noise. It also travels directly from the gear through air.

Detection — Control depends a lot on the determination of transmission paths. They are complicated by couplings between parts, resonant members, radiating areas and patterns.

All machine parts resonate. When a source vibrates, the frequency is picked up by sympathetic members. That's the way a comparatively small source can create a big noise.

With a little effort, you can frequently cut noise dramatically by reversing the effect: Change the frequency of the source or the sympathetic member.

Transmission is aided three ways: By solid and structural parts and by magnetic or air-

JONES & LAMSON THREAD TOOLS

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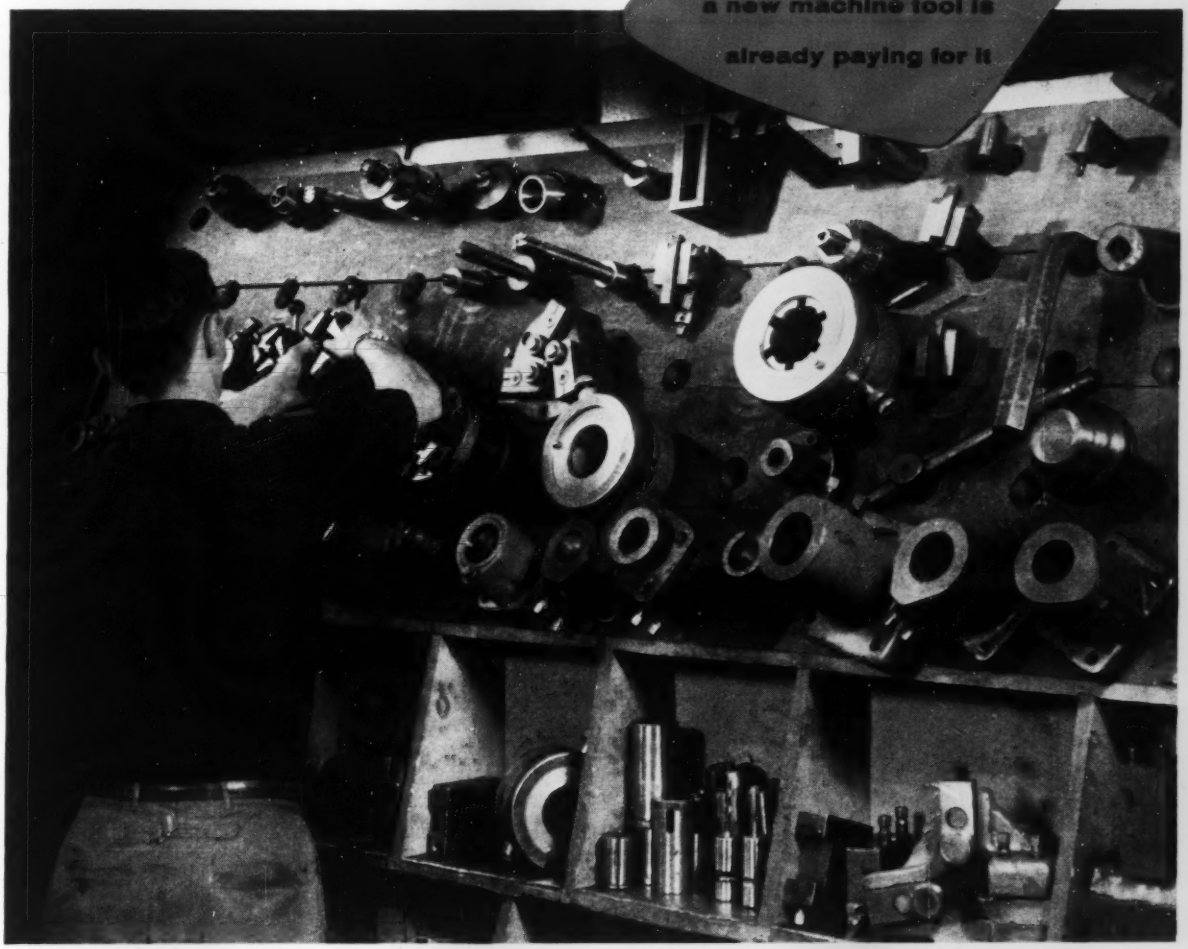

Each and Every J & L thread tool product guarantees quality . . . reduces perishable tool cost

J & L's well-known system of "No Approximations" applies right across the board, for all J & L Thread Tool Products.

Die Heads – Revolving and stationary types for multi-spindle automatics, drill presses, special machines or turret and engine lathes.

Tangent Chasers – Can be changed in seconds; give up to 30 foolproof resharpenings; interchangeable between revolving and stationary types. Class III threads are guaranteed . . . every time!

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Remedies for Common Noise Problems

CAUSE	EXAMPLES	CURE
Striking	Gear teeth Hammers	Lubrication Felt or rubber laminate Cushion
Rubbing	Gear teeth Slides	Lubrication Change material, damping
Air exhausts	Air nozzles	Muffler, smoother exhaust surface
Vibration	Unbalanced shafts	Balancing, change from solid to hollow shaft, change support pattern of beams, frames
Magnetic	Transformers	Change position, use nonmagnetic materials adjacent to source

NOISE CONTROL . . .

borne coupling. Transmission from gear teeth through a shaft is an example of a structural coupling. An iron cabinet cover near a heavy alternating current field will vibrate—an example of magnetic coupling. Air-borne sound sometimes vibrates a wall or beam in its path, a major problem in airplanes.

Any vibrating mechanical member produces some noise. To be an efficient radiator, it must be at least as long as 1 wave length of the vibrating frequency. If it's larger, the noise radiated will be in rough proportion to surface area.

Attack — You can control machine-produced noise at the origin, along the transmission path, at the radiating surface or between source and the listener.

Source Control — This involves impact reduction. One way is to reduce deceleration. A piece of rubber will cut down the noise of a piston hitting the end of a cylinder. Or you can dampen the parts by laminating them with felt or damping compound. (It's more practical on thin sheets.)

Source control also involves noise made by two parts rubbing. Lubrication is an obvious solution. Changing materials is another.

Damping is also successful. The coil spring in an auto brake drum is an example. It damps one of two rubbing parts, reducing brake squeal.

Muffle Air — Whenever air is used to operate machinery, it's best to keep velocity as low as possible. Eliminate all rough surfaces which contact the air stream. A simple muffler controls air exhaust noise.

Coupling Amplifier — When a machine vibrates, it makes noise. You'll hear it even louder if it's coupled to a large enough radiating surface.

Try eliminating vibration at its source. Balance rotating machinery and oscillating parts. If that isn't practical, attack the problem through the transmission path or radiating surface.

Magnetic noise is reduced by controlling leakage flux or replacing parts with nonmagnetic materials. Reorienting the magnetic source (changing the axis of the flux) is another possibility.

Uncoupling—Noise sources are coupled to a radiating member through solid parts, air or magnetic paths.

Soften the connecting material to eliminate noise transmission through solid parts. Examples: Flexible hoses, gaskets, washers, tar-filled joints. Modern trolley cars wheels have a rubber ring between the tire and wheel.

An enclosure around an offending machine is a good method—it only needs to be 1/16-in. thick to cut noise 15 decibels. Enclosures are improved by mounting acoustical material on the inside walls. It must be isolated from the vibrating parts of the machine. Also, don't let it touch the machine.

Most noise production in machinery is amplified by resonating structures. You can locate them by changing the frequency of the source or the resonant member.

For example, a hollow shaft can be substituted for a solid shaft. Frame members can be supported at the center or some other point to break up vibration.

Cut Radiation—Surface size is the most important factor (the smaller the surface, the less the sound). So keep machine covers small.

Internal damping also helps. Lead would be a good material (it's expensive), but auto body undercoating gives the same effect. This also is effective: A glass fiber sandwich between two sheets held together with rivets or bolts.

Noise Can Be Costly—New York and Wisconsin have laws which provide compensation for workmen whose hearing is damaged at work. Noise control not only avoids such claims, it also improves working conditions.

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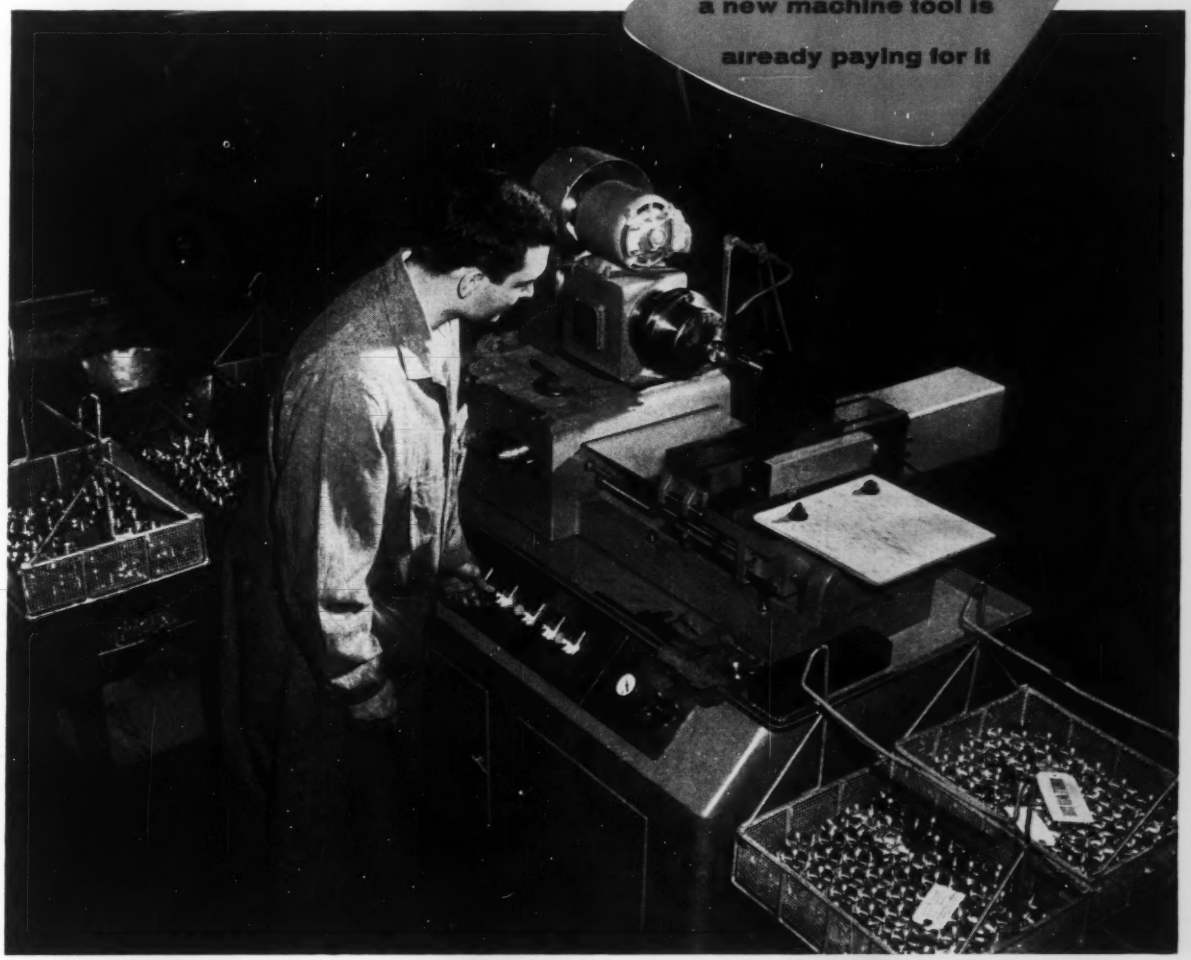
JONES & LAMSON MACHINE TOOLS

the man who needs a new machine tool is already paying for it



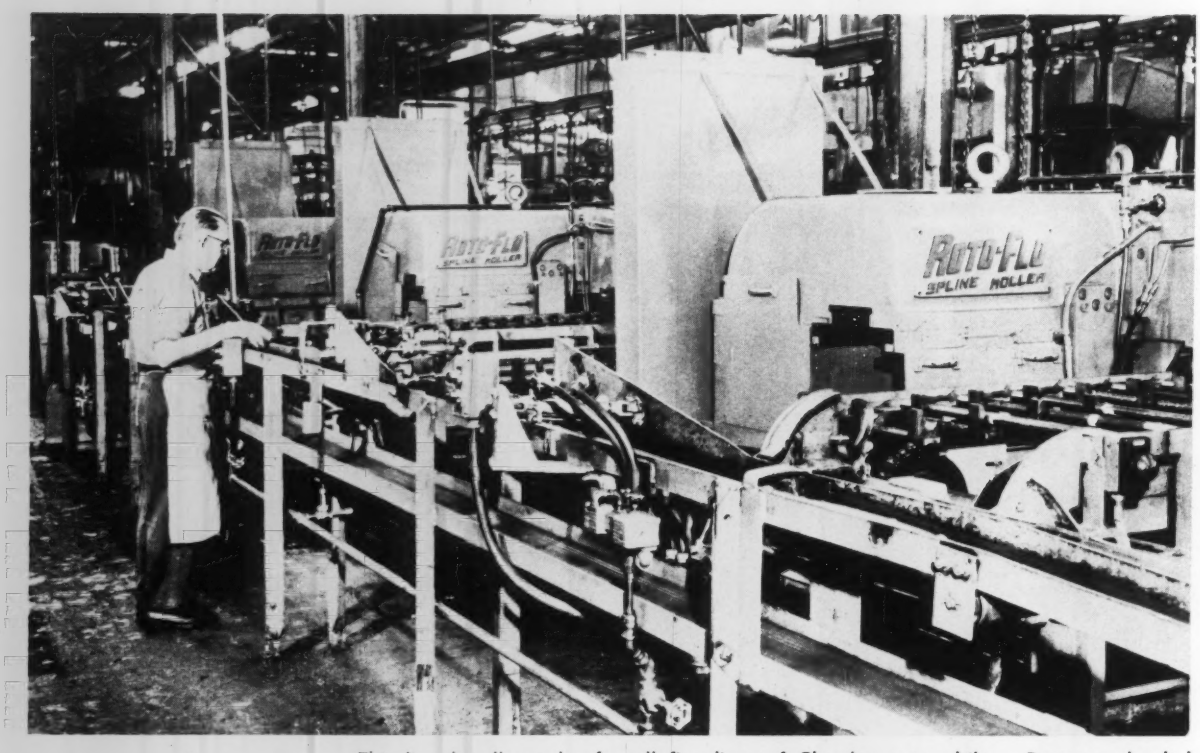
Now — a machine that turns, bores and faces with great accuracy . . . at truly low cost

The new Jones & Lamson Precision Boring Machine may very well be just what *your* production operation needs. This new machine performs turning, boring and facing operations accurately, speedily and economically. Here it is shown on the job at Olson Mfg. Co., Worcester, Mass., turning, facing and boring electronic parts, in lots of 4000 to 6000 pieces. Two O.D.'s are held to .0005″, and two bores to .0002″. Concentricity between the bores, I.D.'s, and faces, is held to a total of .0008″, at high production rates.

The J & L Precision Boring Machine is ideal for both long and short runs . . . is extremely versatile . . . is easy to set up . . . and spindle runout is less than .000020″. Maximum swing is 10″ dia., and maximum bore is 3″ dia. Single or double spindle; push button cycling, manual or automatic.

Write for complete details. JONES & LAMSON MACHINE COMPANY, 517 Clinton Street, Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Milling & Centering Machines • Optical Comparators • Thread Tools • Thread & Form Grinders



This line handles axles for all five lines of Chrysler automobiles. Parts are loaded automatically from preceding operation. Each machine makes 360 splines an hour

Chrysler Adopts Spline Rolling

Forcing the metal into shape cold replaces standard hobbing of spline on axle shafts. Method eliminates chips, increases floor space, says machine maker

THE three machines in the illustration above roll splines into more than 12,000 axle shafts each day at Chrysler's Lynch Road plant, Detroit.

They replace six multispindle hobbing machines. The firm says the change has brought about these advantages:

1. Lower part cost.
2. Improved surface finish (5 microinches rms).
3. Parts are stronger due to cold flowing characteristics.

In addition, tool costs have been slashed, more floor area is available for other operations and chip removal has been eliminated.

How It Works—The spline rollers (Michigan Tool Co., Detroit) have been automated with belt conveyors. The operator on the preceding machine places shafts on a conveyor that drops them automatically into a V-shaped slot on the machine conveyor. Parts continue through the rolling operation and are unloaded on a conveyor which carries them to heat treating.

Splines are formed by dies which resemble racks. Chrysler and Michigan Tool engineers selected M-2, a high speed, high compression resistant molybdenum steel. Tool life has increased to a minimum of 100,000 parts per grind. In a few cases, the firm gets up to 200,000 parts per grind.

Each machine makes 330 splines an hour. Changing dies takes about 20 minutes.

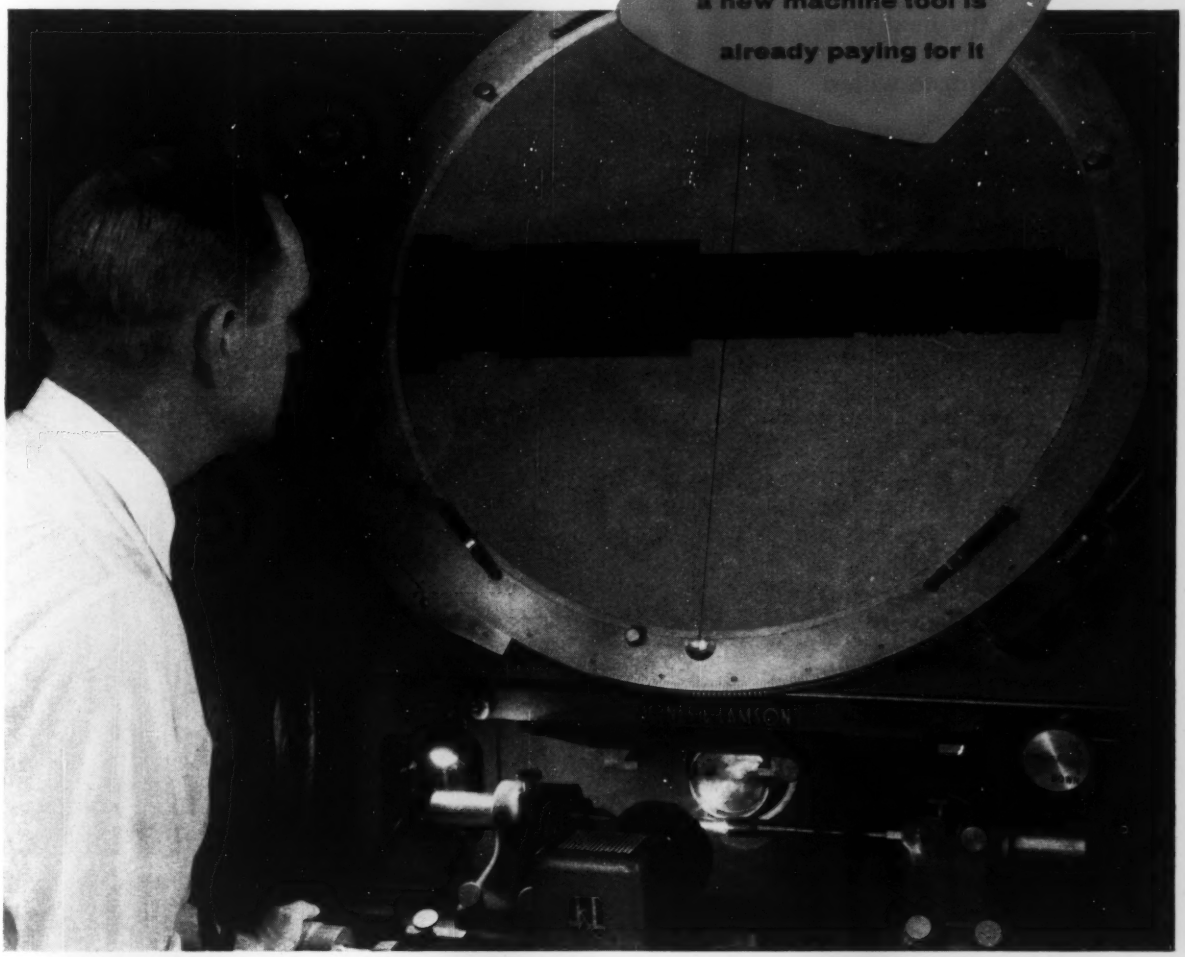
Design — The spline on each shaft has 30 teeth, 1.62 in. long. Diametral pitch is 24/48, pressure angle 30 degrees. Outside diameter is 1.290 in., root 1.185 in.

Hobbed splines used to be straight sided. The rolled splines do not greatly increase the root diameter. Result: A 30 per cent increase in strength without a size increase. Tests have indicated that no shaft fails because of spline weakness.

Trend—Chrysler's switch is an example of the Detroit move to methods which eliminate chips. Most methods of this type rely on moving metal cold (room temperature).

JONES & LAMSON OPTICAL COMPARATORS

the man who needs a new machine tool is already paying for it



Inspections formerly "Impossible" are now done at a glance

Not so very long ago, the quality control inspection of intricate parts was a mean, painstaking job. It called for a number of gages, lots of computations, a good sense of "feel" and, in many cases, sheer instinct. Even then, there was a margin for error.

Things are quite different now. Take this application, for example. The piece being inspected is a precision gear shaft. Its oil grooves, shoulder lengths and several diameters, as well as the lead, pitch diameter and thread angle of its thread and worm are *all* inspected in *one simple operation* by a Jones & Lamson Optical Comparator. And the inspection is precise, to .0001".

The speed, accuracy and versatility of J & L Comparators could very well improve *your* production. Write for our latest Comparator Catalog. JONES & LAMSON MACHINE COMPANY, 517 Clinton St., Springfield, Vermont.

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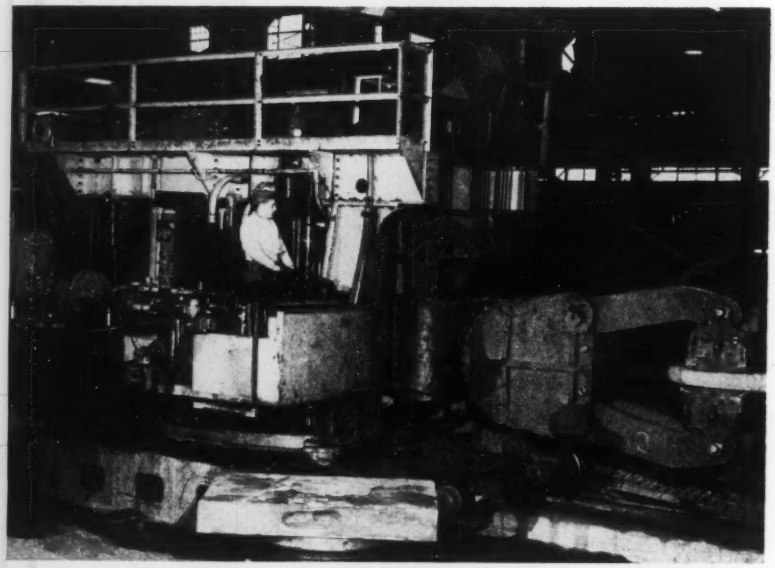
Consider it the next time you're faced with a big repair job on a major piece of equipment. Replacement of broken parts may cost you a lot of production time



Heavy forging manipulator for positioning and rotating ingots and slabs weighing up to 75,000 lb under forging press dies

Welding Solves Down Time Problem

By PAUL H. LESSARD
General Plant Superintendent
Industrial Forge & Steel Inc.
Canton, O.
and
W. E. HEESTAND
Welding Engineer
Alliance Structural Co.
Alliance, O.

WELDING a broken part in a large manipulator, instead of replacing it, saved 45 days of production time at Industrial Forge & Steel Inc., Canton, O.

The equipment rotates and positions heated ingots and slabs in the dies of a forging press. It can handle stock weighing up to 40,000 lb in its grippers. (Occasionally, it is called upon to handle pieces as heavy as 75,000 lb.)

Problem—A 90 per cent overload resulted in fatigue failure through the flange of the 10 ft 4½-in. peel, the central supporting member which carries the gripper jaws on its outboard end.

The peel is a hollow forging of SAE 1045 steel, 21 in. OD and bored full length for a hydraulic ram 6 in. in diameter that opens and closes the jaws. It weighs 7.7 tons, is normalized to 179 Brinell and has a tensile strength of 110,000 psi.

Solution—Since it takes 60 to 75 days to make a new peel, it was decided to saw off the outboard end 38¾-in. from the flange, then weld on a new forged section, 3 tons of SAE 4340 steel.

The high-strength alloy contains 1.65-2.00 per cent nickel, 0.70-0.90 per cent chromium and 0.20-0.30 per cent molybdenum. The carbon range is 0.38-0.43 per cent, and a normalizing heat treatment gives a Brinell of 225 and a tensile strength of 225,000 psi.

The new end section is 1¼-in. longer than the portion removed, but otherwise is a duplicate.

Machining — The groove was formed by machining the ends of the new and old parts. The new section overlaps the old on the inside diameter by 2 in. and is 1 in. thick.

A ⅛-in. square groove was machined at the junction of the two pieces at the base of the groove. The root groove dimension had to be maintained accurately in preliminary positioning on the turning rolls, so that the first weld pass would penetrate fully and join the two pieces securely.

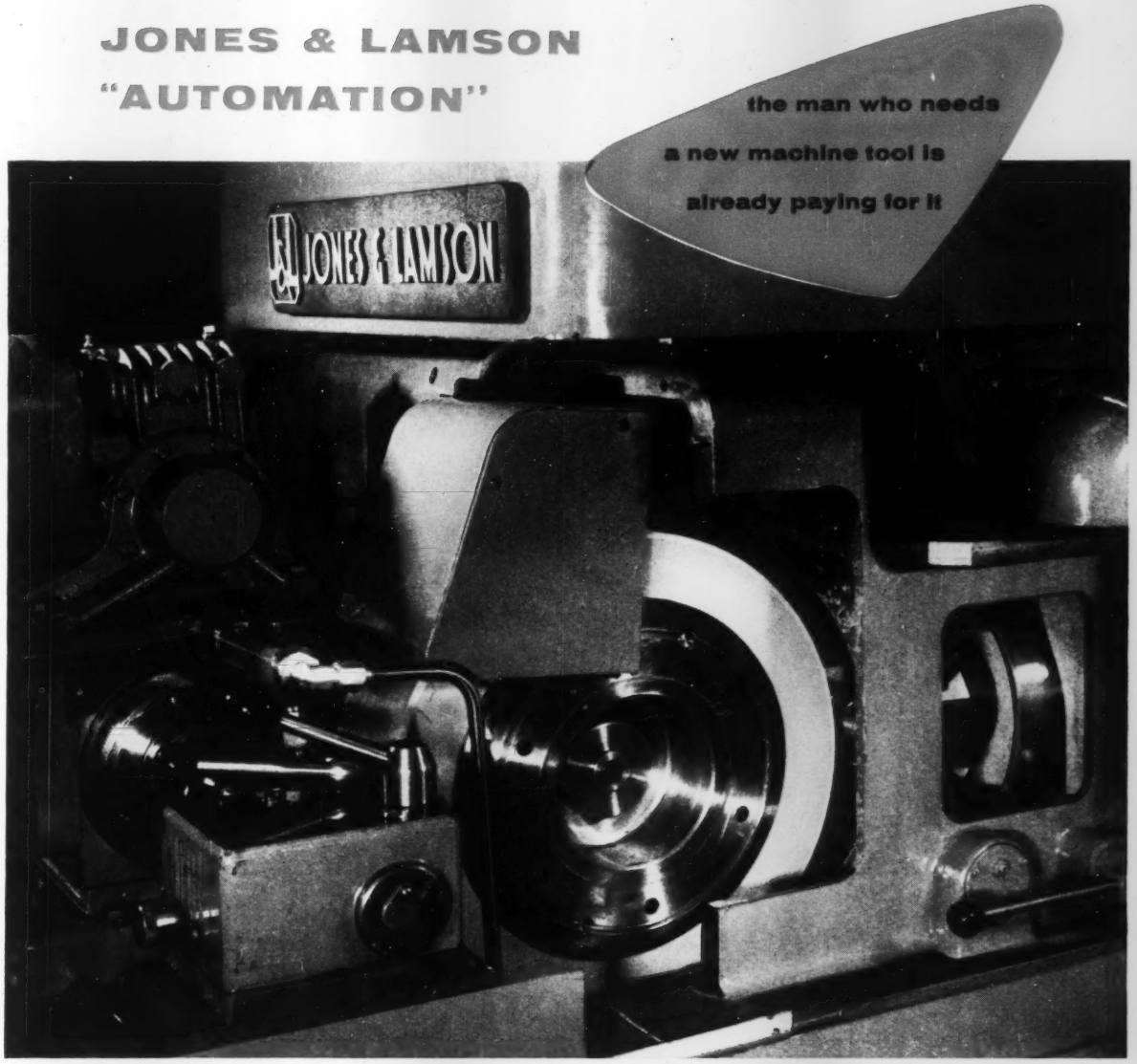
Preheat — After positioning on powered rolls, the parts were wrapped with asbestos, except for the exposed groove, and preheated by gas burners in the joint area to 650°F.

Manual Weld—The first 2¼-in. of weld metal in the groove were laid down manually with ¼-in. coated rod (AWS class E-10016).

The electrode is a low alloy steel with a high-mineral potassium type (low hydrogen) coating, giving a weld with a tensile of about 120,000 psi stress relieved.

Switch—In the next step, automatic submerged arc welding was used. A Lincoln Electric submerged arc head was mounted on a boom

JONES & LAMSON "AUTOMATION"



Now — for the first time in grinding history... no cycle time out for wheel dressing

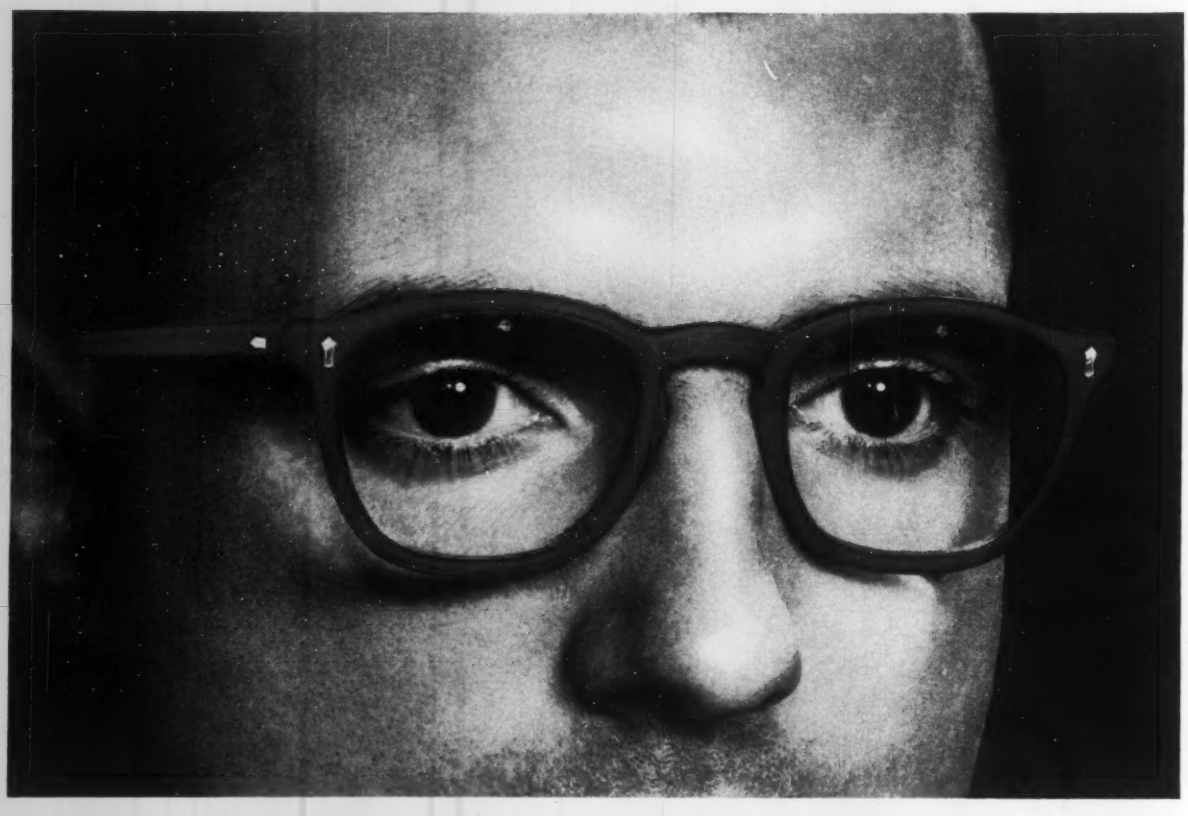
Jones & Lamson is now introducing "PFC" (perpetual form control) grinding, an automated high production grinding method that has been termed "the greatest improvement in grinding in 50 years." It represents the first broad-scale industrial application of "CDP" (cemented diamond particles).

PFC, the result of several years of cooperative research and development by Jones & Lamson and Koebel Diamond Tool Co., Detroit, makes it possible to (1) *Completely* automate grinders. (2) Re-shape and re-size wheels faster than by any other method, and to do it continuously, with no time out for wheel dressing. (3) Control grinding wheel shape and size throughout a CDP cutter life of many months, without any attention to the cutter-dresser. (4) Provide and maintain a faster-cutting surface, free of debris. (5) Produce and maintain accurate grinding wheel shapes and forms within narrow dimensional limits.

Write for folder No. LO-5709. JONES & LAMSON MACHINE COMPANY, 517 Clinton Street, Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Milling & Centering Machines • Optical Comparators • Thread Tools • Thread & Form Grinders

You asked for it...Here it is!



AO F9500 and AO FX9500* Ultrascopic Safety Glasses

in Copper Bronze Acetate

To accommodate the many workers who have requested this popular shade with their safety glasses, American Optical now offers the F9500 plastic line of Ultrascopic glasses in copper bronze acetate butyrate — *in all styles and sizes.* Thus, workers now have a choice of pink crystal and copper.

This handsome copper bronze styling will appeal to all workers, both men and women. The bronze appearance will not fade or discolor, but will maintain its smart good looks indefinitely. As an added quality touch there is a new rivet bearing the American Optical monogram. The F9500 in copper bronze can be furnished with clear 6.00 curve Super Armorplate lenses, or Calobar lenses in medium, dark or extra dark shades.

These American Optical safety glasses and the companion metal line of Ultrascopic glasses both offer "Balanced Vision" in safety R$_x$ glasses — an American Optical "first" which, by assuring optimum seeing qualities, increases visual efficiency and safety on the job while reducing production and eye accident costs. For complete details of the many outstanding features of the American Optical Ultrascopic line, write for literature or call your nearest American Optical Safety Products Representative.

*NOTE: The FX9500 Series is the same as the F9500 Series but with adjustable nose pads for hard to fit workers.

Always insist on
Ⓐ Trademarked Lenses
and Frames

American Ⓐ Optical
COMPANY
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS
BRANCHES IN PRINCIPAL CITIES

directly over the joint. The electrode wire was Lincoln L-60 mild steel, 5/32-in. in diameter, used with a specially compounded agglomerated alloy flux.

The flux was fed continuously over the arc, supplying sufficient ferroalloys to develop an analysis of about 1.80 per cent chromium, 1.70 per cent nickel and 0.50 per cent molybdenum in the weld deposit.

Tensile strength after stress relieving is in the 110,000 to 115,000 psi range.

Automatic welding was done at 475 amperes and 28 arc volts. The peel rotated under the head to permit a travel speed on the bead of 18 to 20 in. per minute.

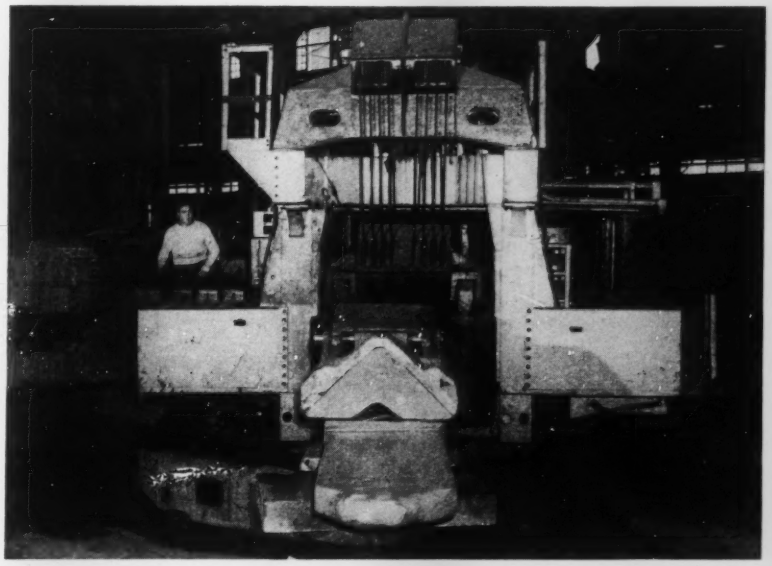
Completion—A number of passes were required to fill the weld groove with over 150 lb of weld metal. The submerged arc portion consumed over 160 lb of alloy flux.

Following welding, the entire peel was transferred to a stress relieving furnace where it was heated to 1150°F and held for 12 hours. It was cooled to room temperature in the furnace.

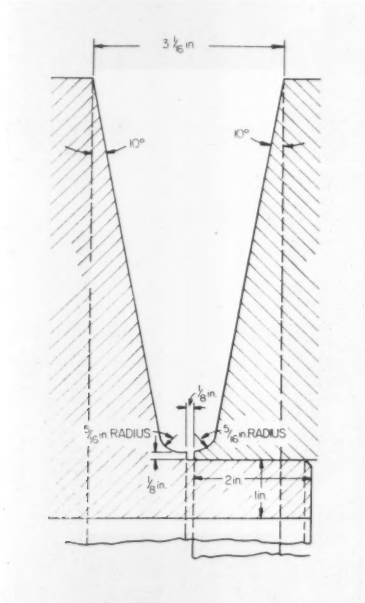
Testing—Then the peel was counterbored to about 8⅛-in. to insure high strength weld metal at the bottom of the groove.

Finally, the weld area was machined smooth and ultrasonically checked for cracks or other discontinuities.

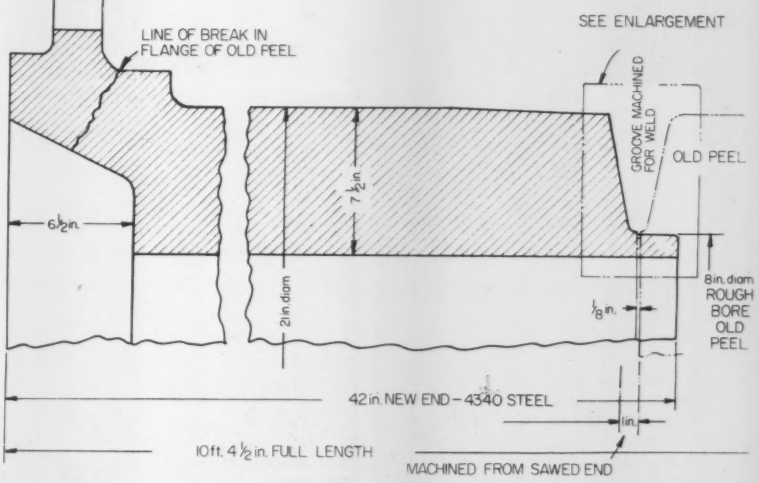
No deficiencies were indicated, and the manipulator was back in service after 28 days of down time. Considerable savings were realized by the salvage of nearly two-thirds of the old peel forging.



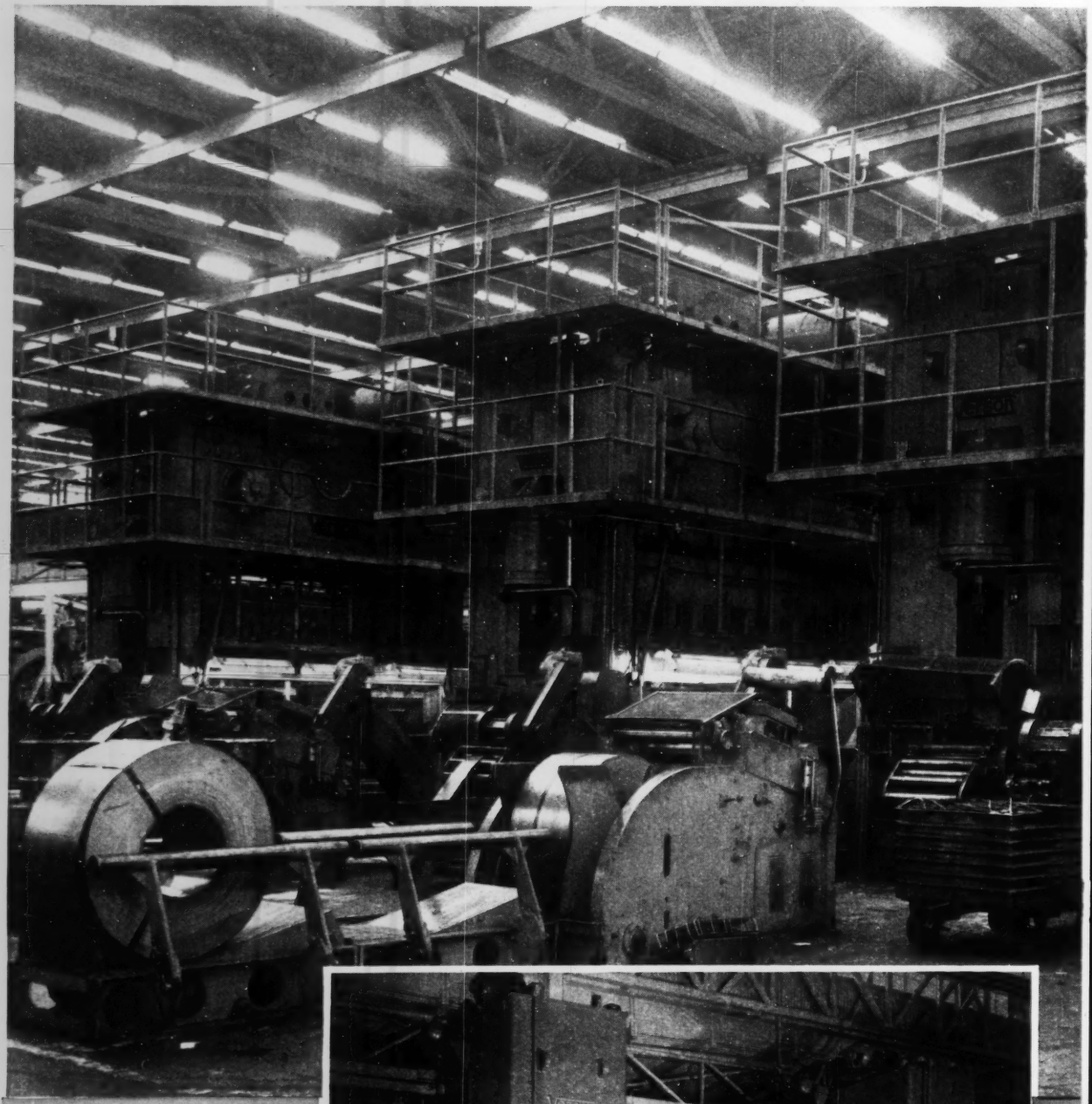
Front view of the manipulator. By cutting off the outboard one-third of the mild steel peel and welding on a new SAE 4340 steel end, the equipment was returned to service with a saving of 45 days

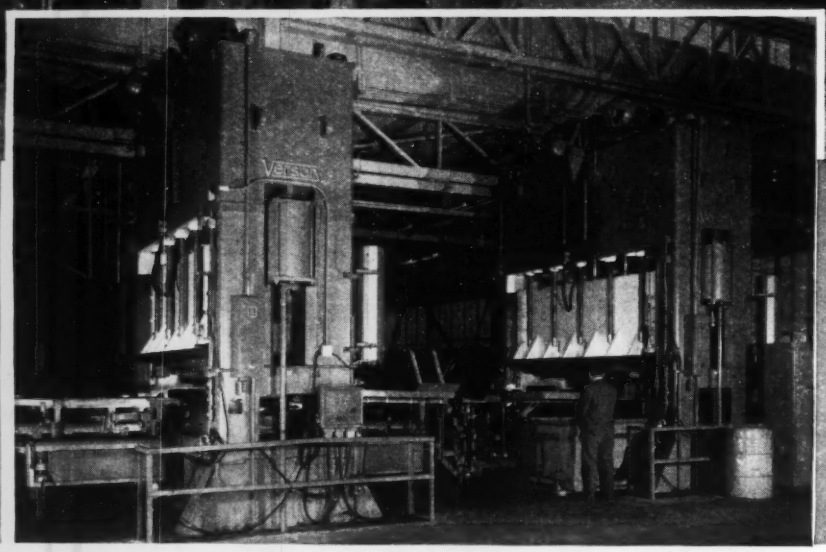


Close attention was paid to accurate maintenance of the ⅛-in. square groove at the base of the weld groove, so that full penetration at this point would be assured


LINE OF BREAK IN FLANGE OF OLD PEEL
SEE ENLARGEMENT
GROOVE MACHINED FOR WELD
OLD PEEL
7 1/2 in
6 1/2 in
2 in diam
1/8 in
8 in. diam ROUGH BORE OLD PEEL
42 in. NEW END – 4340 STEEL
1 in.
10 ft. 4 1/2 in. FULL LENGTH
MACHINED FROM SAWED END

Sketch of upper half of the new alloy steel flange end, indicating how it was fitted to the old peel and especially machined for automatic submerged arc welding





An automated Verson press line which incorporates two standard Verson 400 ton Eccentric Presses. Changing requirements could be met by modifying handling equipment or the presses could be used individually.

159

A Verson Press for every job from 60 tons up.

A good example of Transmat versatility. Each of these three identical 800 ton, 8 station Verson Transmats is capable of making any of four different automotive parts at the rate of 1000 per hour.

You can combine versatility with automatic high speed production

. . . with Verson Transmat Presses or an automated Verson press line

Verson Transmat Presses or Verson Automated Press Lines are designed first and foremost for the purpose of producing a specific multi-operation stamping in large quantities at the lowest possible cost. Any other consideration is secondary to the achievement of this objective.

However, Verson engineering has made it possible to offer surprisingly broad versatility in machines that would normally be considered single purpose. The Transmat, for example, has individually adjustable wedge slides which may be arranged for ram cushions. Adjustable stroke individual knock out cylinders are provided at each station. A variety of bed cushion arrangements is available. Provision can be made for stack or coil feed. Non-oscillating feed bars are adaptable to changing requirements. By taking advantage of these features, users have been able to make more than one part on the same Transmat.

The automated press line, since it often incorporates standard presses, is even more versatile. Handling equipment can often be modified to accommodate radical changeover.

If uncertainty about the adaptability of high production tool ups to changing requirements has kept you from taking advantage of the cost reductions they make possible, it is time to talk to Verson application engineers. They will welcome the opportunity to show you what has been done and what can be done. And remember, the Verson concept is to give you versatility without sacrificing the cost cutting advantages of high output.

TRADE Verson MARK

ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION

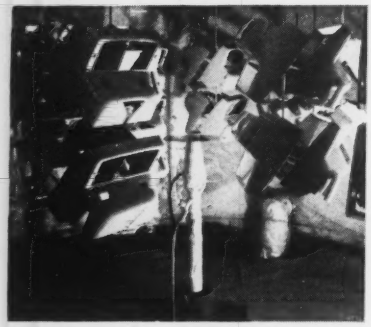
VERSON ALLSTEEL PRESS CO.

9318 S. KENWOOD AVENUE, CHICAGO 19, ILLINOIS • 8300 S. CENTRAL EXPRESSWAY, DALLAS, TEXAS

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES
TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES

IBM relies on **RANSBURG NO. 2 PROCESS Electrostatic Spray Painting** to get the excellent and uniform high quality wrinkle finish on all

IBM ELECTRIC TYPEWRITERS



Both prime and finish coats are uniformly applied to IBM Electric Typewriter cases as they rotate around the floor-mounted Ransburg No. 2 Process reciprocating disks. Automatic Electro-Spray provides three times as many pieces per gallon as by former hand spray.

IBM's strict quality standards are easily maintained with Ransburg No. 2 Process in the painting of Electric Typewriter parts. Rejects by the former hand spray method used to run as high as 30% on some parts. Now, with automatic Electro-Spray, rejects for all reasons are only 3% to 5%.

Three Times as Many Pieces per Gallon!

Along with increased production, paint mileage is stepped up, and they get three times as many pieces per gallon as by the former hand spray method. That's because efficiency of the Ransburg No. 2 Process Reciprocating Disk puts the paint where it's supposed to go . . . on the parts.

Want to know how Ransburg Electro-Spray can improve the quality of your painted products . . . and at the same time, cut your paint and labor costs? At no obligation to you, we will make complete laboratory tests with your products to prove the advantages and cost saving benefits which can be yours with Ransburg No. 2 Process. Write or call.

Ransburg **ELECTRO-COATING CORP.**
Indianapolis 7, Indiana

RANSBURG

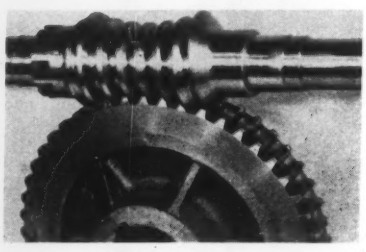
Built to take shock loads, speed reducers power offset rolls which feed and descale pipe entering Mannesmann tube mill reeler

Rugged Gear Drives

A FOOTNOTE to the opening of the Mannesmann tube mill in Sault Ste. Marie, Ont., (STEEL, June 24, p. 159, and July 8, p. 104) is the announcement by Cone-Drive Gears Division of Michigan Tool Co., Detroit, that 675 of its speed reducers went into the mill. They are of the double-enveloping worm gear type.

The worm is hour-glass shaped so that it conforms to the circumference of the spur gear for several minutes of arc. The face of the spur gear is "throated"—hollowed to match the circumference of the worm. The result is a gear combination which places many teeth in contact.

In a size for size comparison with other types of reducer gearing, the double-enveloping type is able to carry heavier loads and at a lower cost in horsepower delivered, say Cone Drive engineers. In the Mannesmann mill, 20 per cent of the power passes through this type gearing.

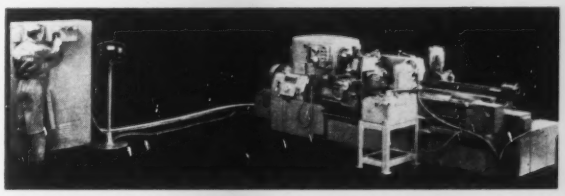


Lathe for Special Turning Operates by Remote Control

Air gage tracer equipment can be used at a distance of 12 ft with this lathe. It is designed for special turning operations such as machining radioactive materials and contouring solid propellants for rockets and missiles.

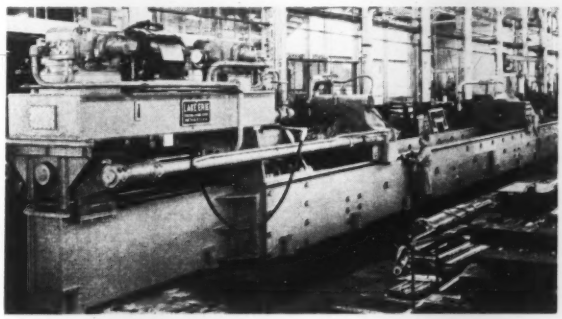
The main drive motor can be started, stopped, or reversed; the spindle can be jogged, run, braked, or shifted to a second preselected turning speed, and feed rates may be varied according to workpiece requirements (all from the remote position).

Tool movements are regulated during the operation by the tracer mechanism mounted on the machine.



It is not necessary for the operator to see the machine while the turning is in progress. *Write*: Monarch Machine Tool Co., Sidney, O. *Phone*: Hyacinth 2-4111

Hydraulic Stretcher for Extrusions Is 91 Ft long



Extrusions from 5 to 50 ft long can be straightened and detwisted by this unit. The stroke is 6 ft.

The detwist head rotates on roller bearings. Jaw openings in the head and tailstock range from 9½ to 17 in. The hydraulic system operates at 2550 psi with a take-up speed of 520 in. a minute, a stretching speed of 141 in. a minute and a return speed of 885 in. a minute.

Centering is done by gripping the extrusion with the vertical jaws and adjusting the independent side jaws. *Write*: Lake Erie Machinery Corp., 882 Woodward Ave., Buffalo, N. Y.

Hydraulic Cutter for Steel Rods and Bars

In one bite, this machine cuts carbon and alloy steel rods, reinforcing rods and drill rods in sizes up to 1⅜-in. in diameter.

Equipment consists of a lightweight portable cutterhead, a heavy duty pump to supply oil pressure, and a single high pressure hose for delivering oil to the cutterhead.

For operator safety, the control circuit is reduced to 12 volts. At any time during the cutting cycle, the operator can stop the cutting action by removing his finger from the control button. The blades immediately return to full open position.

Long blades in the cutting head aid alignment of the workpiece. The head contains renewable bushings and wear sleeves at all moving points.

The pump unit is equipped with large capacity oil filters, an adjustable relief valve and a heavy duty control valve.

Balancers are available for the cutterhead to relieve the operator of strain. *Write*: H. K. Porter Inc., 75 Foley St., Somerville 43, Mass. *Phone*: Prospect 6-8200

NEW PRODUCTS and equipment

Monochromatic Light

Flatness is measured by this light. It is 11 x 14 in. with a work stage 10 in. square. A 9000-volt transformer provides an average of 40 foot-candles of power at the diffusing glass.

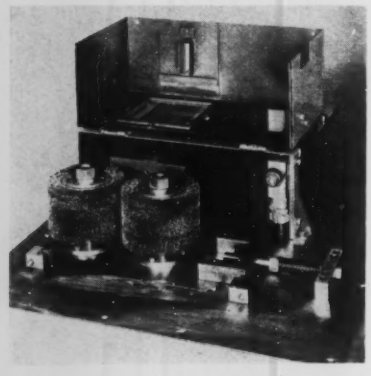
The light head may be tilted back and adjusted for height to permit maximum light on the check area. On pieces too large for the work stage, the light head may be swung completely around to permit checking the work on the bench.

The instrument is a self-contained unit. *Write*: Crane Packing Co., 6400 Oakton St., Morton Grove, Ill. *Phone*: Orchard 3-6800

Wire Stripper

These wire strippers are made to order. They will strip asbestos or glass insulation from the ends of heavy round or rectangular wires.

Length of the stripped ends can be controlled (2 to 24 in.) by an adjustable back stop. The space between the 4-in. wheels is controlled and an adjustable spring allows them to separate when wires are inserted.

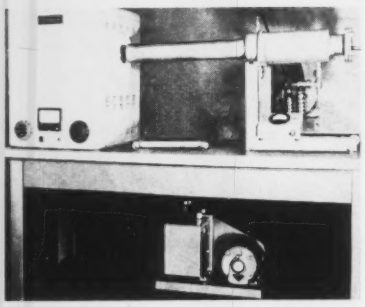


A safety switch shuts off motors when the wheel guard is open. *Write*: Rush Wire Stripper Division, Eraser Co. Inc., 1068 S. Clinton St., Syracuse 4, N. Y. *Phone*: Granite 6-7441

Vacuum Retort

Small parts are processed in a vacuum or protective atmosphere provided by this retort. It is satisfactory for temperatures up to 2000°F at a vacuum of 0.5 microns or better.

The unit consists of a furnace, automatic controller, pyrometer, 3-in. ID tube with a water jacketed cooling chamber, track and accessories for inserting the tube into the heat zone, a 7 in. work boat, mechanical vacuum pump, diffusion pump and vacuum gage.



The work is heat treated and cooled in the same tube. *Write*: Pilot Plant Division, Lindberg Engineering Co., 2321 W. Hubbard St., Chicago 12, Ill. *Phone*: Monroe 6-3443

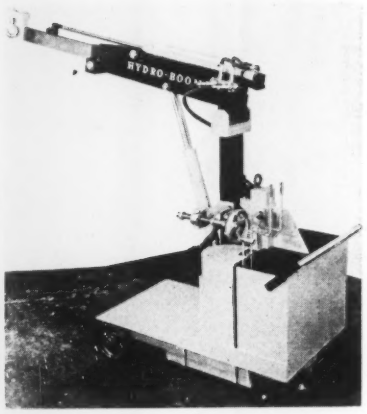
Boom Truck

This boom reaches up to 48 in. beyond the front of the truck. Its capacity at maximum boom extension is 1500 lb.

With the boom movement hydraulically controlled, the operator can position work loads with accuracy to within 0.01 in. in both the vertical and longitudinal directions.

Crosswise movement is directed by a hand-operated screw in a close fitting swivel block.

It is available in hand-operated or battery-powered models, with or without power propulsion. *Write*: Vanguard Engineering Co., 1908 E. 66th St., Cleveland 3, O. *Phone*: Henderson 2-0755



Profiling Duplicator

This duplicator permits two dimensional contour profiling on any vertical miller. Four bolts hold it in position.

The unit is self-contained and is controlled by one lever. Its capacity is 6 x 6 in. with a 1 to 1 ratio for profiling. *Write*: J. M. Kalins Co., 1575 Railroad Ave., Bridgeport, Conn. *Phone*: Edison 3-9405

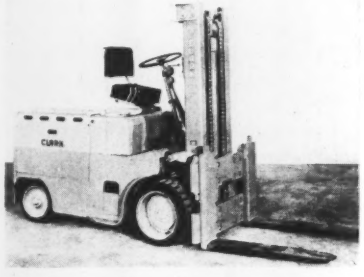
Fork Truck

The 36-volt drive motor of this battery-powered fork truck is fully enclosed.

In addition to the regular hydraulic brakes, a "dead man" brake on the motor drive shaft sets automatically when the driver leaves his seat.

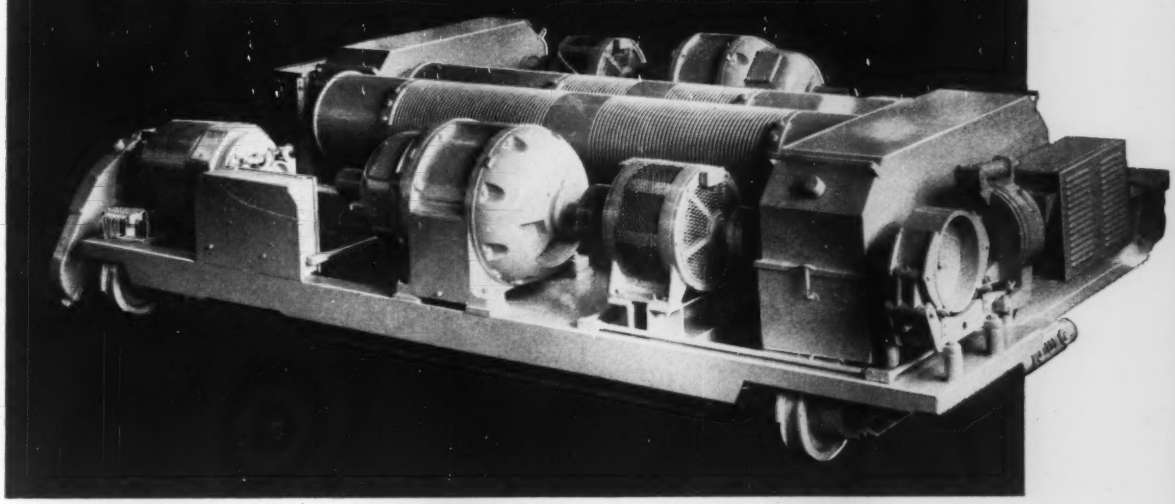
The truck (less forks) is 97 in. long and 51 in. wide. It has a turning radius of 88 in.

A dual hydraulic pump gives positive control of upright tilt and permits lift speeds of 23 ft a min-



For Northern Cranes

EZOMATIC
CRANE CONTROL



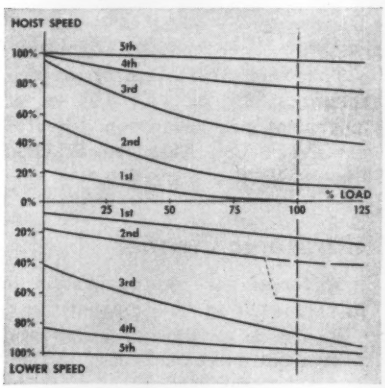
EZOMATIC *is Smooth, Simple, Dependable*

EASIER *to operate*

EASIER *to maintain*

EASIER *to understand*

EASIER *to handle any load*



TYPICAL SPEED CURVES WITH EZOMATIC CONTROL

The new simplified, smooth, accurate control for alternating current hoist motors utilizing full magnetic control combined with an eddy current brake. This improved control arrangement is easier to operate, easier to maintain, makes handling any load easier, safer, more accurate. Regardless of load the speed characteristics both hoisting and lowering are excellent, allowing smooth handling and accurate spotting of any load.

Standard control components familiar to all electrical maintenance and operating men are used throughout. Circuits are simple and readily understandable. No complicated electrical schemes. Used with a standard eddy current brake eliminating mechanical and electrical wear.

Excitation of the eddy current brake is automatically controlled by the motor speed allowing extra smooth acceleration. If fast acceleration is desired it may be obtained by moving the master switch to the last point, thereby eliminating the eddy current brake excitation. Off point braking is provided automatically to assist the motor brake in stopping the load. The motor brake is automatically applied in lowering if the eddy current brake excitation should be interrupted. Speed curves can be readily changed in the field, either up or down by a simple adjustment. When very heavy loads are handled extra lowering speeds are automatically provided.

For further information write to

NORTHERN ENGINEERING WORKS

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ute. Capacity is 10,000 lb. *Write*: Electric Truck Section, Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich. *Phone*: Woodward 2-6561

Magnetic Belt Conveyor

Ferrous loads can be transported at angles up to 90 degrees with this unit.

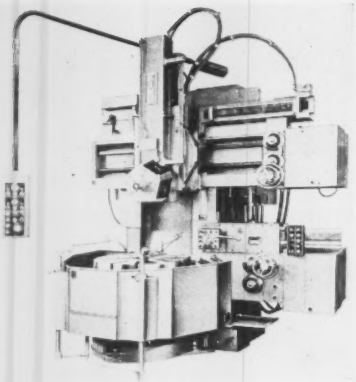
Loads are carried on a thin, rough surfaced belt which slides over a metal bed containing permanent magnets. The like poles of all magnets are connected with metal strips.

The magnetic attraction of these strips holds the load securely on the belt. *Write*: Alvey-Ferguson Co., 1786 Disney St., Cincinnati 9, O. *Phone*: Redwood 1-7000

Boring Mill

Adjustable stops are provided for vertical and horizontal feed control of all heads of this machine. For the standard five-position turret head, one vertical and one horizontal adjustable stop are provided for each of the turret faces.

The machine has provision for 24 feeds from 0.0016 to 0.250 in. per table revolution and 24 speeds in any of three standard ranges (low, intermediate and high).



Both feed and speed are preselected from direct reading dials. *Write*: Machine Tool Division, American Steel Foundries, 1150-X Tennessee Ave., Cincinnati 29, O. *Phone*: Redwood 1-9210

Welding Rod

This rod is used for joining and sealing tanks and containers using mechanical wraps. It is used with steels and copper and nickel alloys.

Application temperatures range as low as 400 to 500°F. The alloy to flux ratio is controlled to deposit the exact amount of flux required. *Write*: Technical Information Service, Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing 58, N. Y. *Phone*: Flushing 8-4000

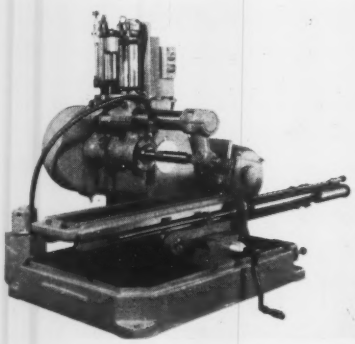
Milling Machine

This machine can be used as an independent head mounted on any base or a semiautomatic machine with air-hydraulic head and table feeds. It is used for slotting, sawing, face milling, keyway cutting, slab milling and boring.

It may be equipped with a micrometer depth stop, screw manual head feed and longitudinal screw feed table for horizontal boring operations.

Carbide or ceramic tools can be used when it is equipped with a high speed head and motor.

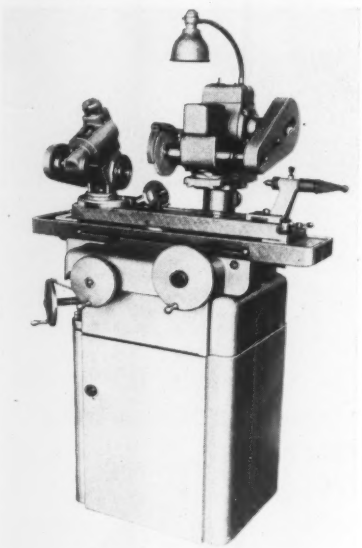
A coolant system may be added easily since the reservoir and collecting area are cast into the standard base. *Write*: U.S. Burke Machine Tool Division, Cincinnati Mfg. Co., Brotherton road & Pennsylvania railroad, Cincinnati 27, O. *Phone*: Bramble 1-5000



Grinders

All of the shafts of these grinders are ball-bearing mounted. The saddle ways are automatically compensated for wear.

The working surface is 5¼ x 27¼-in. with a table traverse of 14 in.



The vertical movement of the column is 6¾-in. with 0.04 in. of movement per revolution. *Write*: K. O. Lee Co., Aberdeen, S. Dak. *Phone*: 4618

Ultrasonic Cleaner

A forced air cooling system is incorporated in this cleaner.

It has a circulating pump and permanent filter element. An additional tank for recirculating the fluid eliminates manual draining. The circulator automatically begins operating at the conclusion of the predetermined cleaning period.

The cleansing action is achieved by cavitation produced by ultra-

In carrier landings, planes coming in at more than 100 knots are stopped in a split second. This amazing performance is made possible by having each plane hook onto one of several wire ropes stretched across the flight deck. Both plane and rope receive an almost unbelievable shock at the moment of contact. Needless to say, only top-quality wire ropes can be used for this application because . . .

you can't bargain with safety

While your use of wire rope differs from this carrier application, *safety should be just as important to you.* For, although a "bargain" rope may save you money, it can cost you your peace of mind. So don't bargain with safety. Buy a rope that's a *quality* rope—buy Wickwire Rope. 5049

WICKWIRE ROPE — A CF&I PRODUCT

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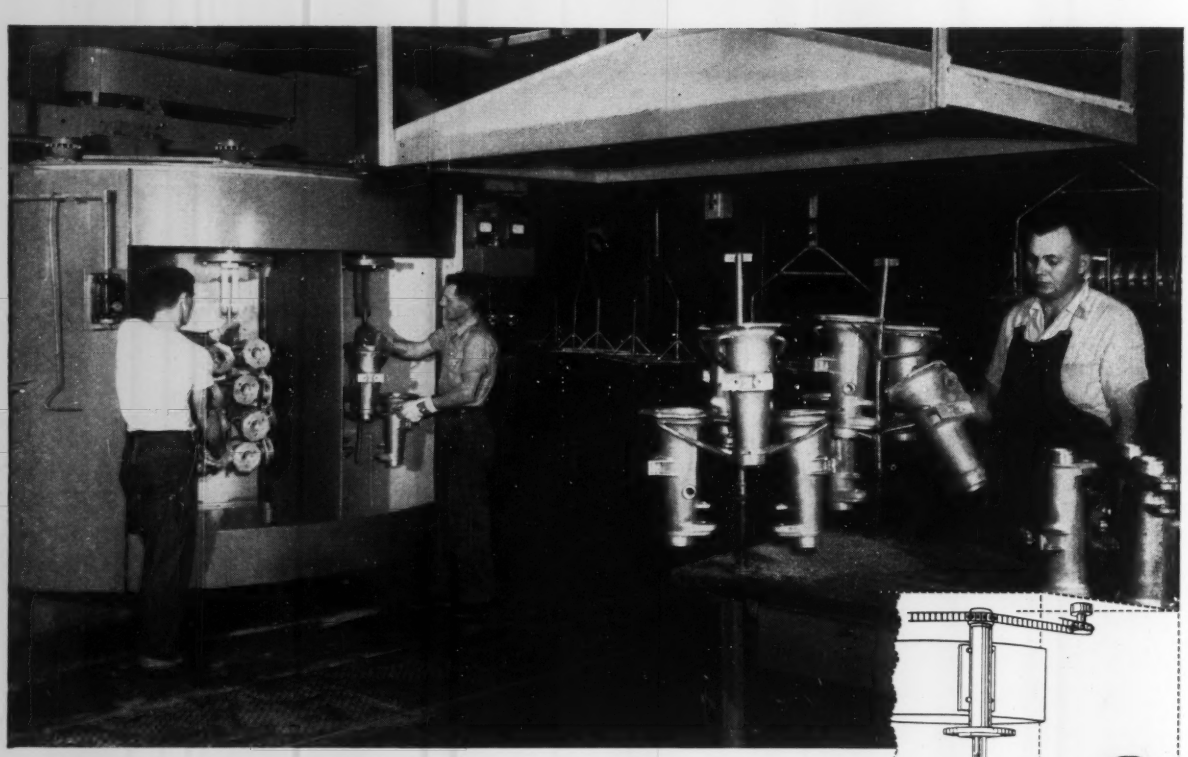
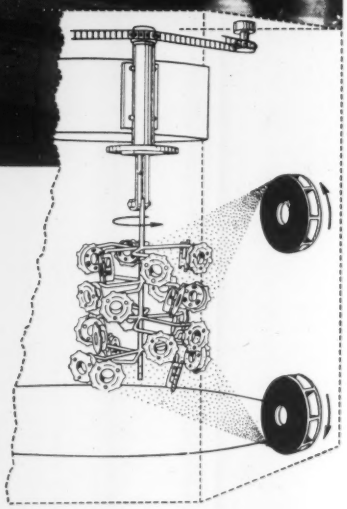
New York • Philadelphia





WHEELABRATOR®

deburrs Chrysler PowerFlite parts

more thoroughly at low cost!

Deburring and cleaning many of the parts in Chrysler PowerFlite automatic transmissions now is being done by Wheelabrator airless abrasive blasting in the Indianapolis plant of Chrysler Corporation. The reason: Wheelabrator deburring is more thorough since it does not miss surfaces as other methods sometimes do and it has helped reduce costs.

As illustrated in the above sketch, the non-metallic pellets thrown by the Wheelabrator units onto the parts as they are rotated in the blast stream assure greater uniformity in the deburring operation. Two of these Wheelabrator automatic deburring cabinets have been installed. One cleans and finishes cast iron transmission cases, the other deburrs machined cast iron, steel and die cast aluminum parts.

Deburring is only one of the many cost-saving applications of the airless Wheelabrator. Wheelabrator engineers worked closely with Chrysler to solve this finishing problem. This same assistance is available to you, without obligation, for your metal cleaning or finishing problems.

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Catalog 74-C
for complete information.

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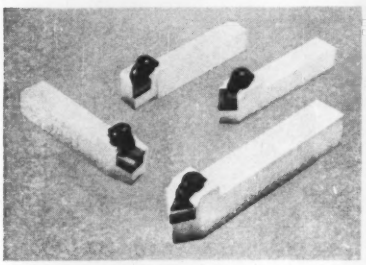
CORPORATION
509 South Byrkit Street, Mishawaka, Indiana

WORLD'S LARGEST MANUFACTURER OF AIRLESS BLAST CLEANING EQUIPMENT

sonic signals transmitted in liquid. *Write*: Vibro-Ceramics Division, Gulton Industries Inc., 212 Durham Ave., Metuchen, N. J. *Phone*: Liberty 8-2800

Toolholder

A clamp with a positive gripping action is used in 116 styles and sizes of this toolholder. They are used with mechanically held carbide inserts.



The clamp screw is accessible from the top and bottom of the holder.

Ten positive rake inserts have been been added to the line. *Write*: Allegheny Ludlum Steel Corp., Pittsburgh 22, Pa. *Phone*: Court 1-5300

Bar and Tube Feeder

This machine has a magazine-loading feed with a constant rate of 5 to 20 ft a minute from the loader to the machine. It can

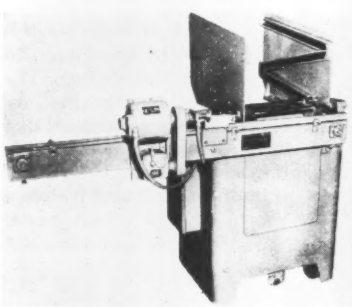


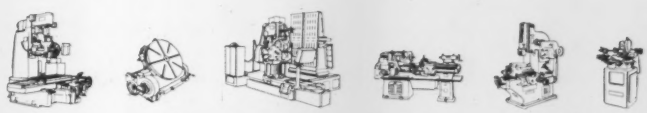
PHOTO COURTESY OF ALUMINUM COMPANY OF AMERICA

World's Largest Die

MILLED EASILY, ACCURATELY ON A P&W KELLER MACHINE . . . Consisting of two halves, each weighing 30 tons, this is the world's largest closed die block. Designed to forge aluminum backbones of fuselage and wing structures for the new multi-jet Martin SeaMaster, this giant die was produced by "Kellering" at the U. S. Air Force Heavy Press Plant operated by Aluminum Company of America.

You may not require a 30-ton worksize capacity, but there is a P&W Keller Machine just right for every job requirement . . . ideally suited to handle your dies, molds, prototype work and production milling faster, easier, more profitably.

Write for complete information.
Pratt & Whitney Company, Incorporated,
13 Charter Oak Blvd., West Hartford, Conn.



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LATHES • VERTICAL SHAPERS • CUTTER AND RADIUS GRINDERS

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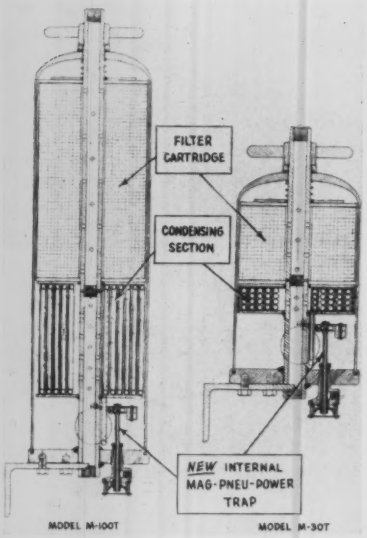
MACHINE TOOLS • GAGES • CUTTING TOOLS

be loaded automatically from a conveyor.

With special tooling it can handle a wide range of parts. It can be adapted to full automatic control and portable operation. *Write*: Feedall Inc., 38399 Pelton Road, Willoughby, O. *Phone*: Willoughby 2-8100

Condensing Filter

A combined magnetic-pneumatic action discharges the condensate from this condensing filter. It is used for condensing moisture and oil vapors and filtering out solid contaminants.



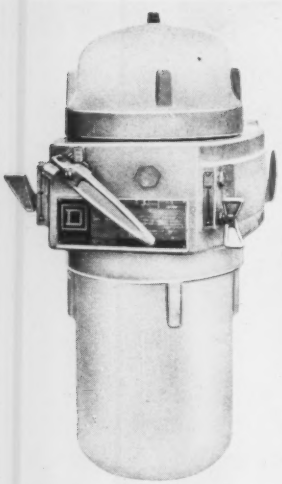
An internal condenser, disposable filter cartridge and automatic condensate discharge are incorporated in each of two units, M30T and M100T. *Write*: Hankison Corp., 951 Banksville Road, Pittsburgh 16, Pa. *Phone*: Locust 1-6711

Motor Starter Enclosure

These are explosion resisting enclosures for NEMA 7 (Class 1, groups C and D) and NEMA 9 (Class 2, groups E, F, and G) frames.

Their threaded joints are dust-tight and weatherproof for use in outdoor and hazardous locations.

The enclosures consist of a collar section, an upper tank and a lower tank. Two types of collar



sections are available, one with a circuit breaker and one without. *Write*: Square D Co., 4041 N. Richards St., Milwaukee 12, Wis. *Phone*: Edgewood 2-2000

Secondary Current Pickup

The pickup device is placed in the throat of a resistance welding machine as close to the faceplate as possible. It records the secondary current patterns for weld timing and heat balance work.

As the resistance welder is fired, a strong magnetic field is created within the machine's secondary loop where the secondary current pickup device is set.

The rising and collapsing magnetic fields sensitize this device which forwards a signal. As the machine is fired, a trace or image is obtained.

When connected to a direct current amplifier and recording oscillograph, high current oscillograms can be recorded permanently. *Write*: Sciaky Bros. Inc., 4915 W. 67th St., Chicago 38, Ill. *Phone*: Portsmouth 7-5600

Dust Collector

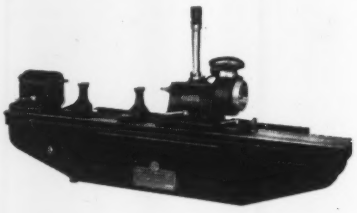
Cylindrical filter elements (4 to 6 ft long) are the heart of this dust collector. It has no moving parts.

A side inlet admits the dust-laden air to the housing. An air circulating system draws clean air from the filter elements.

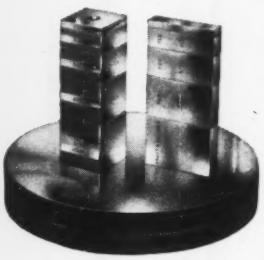
Most of the dust goes to a bottom discharge. The balance is retained on the outside of the filter ele-

(Advertisement)

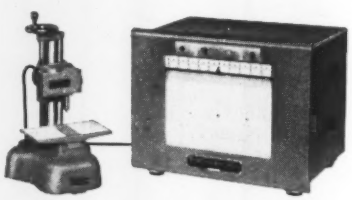
Basic Equipment for Higher Precision



P & W STANDARD MEASURING MACHINE
. . . is used throughout industry to measure gages, tools and finished products for diameter, length, roundness, straightness, parallelism and taper direct to .00001" with controlled measuring pressure.



P & W PRECISION GAGE BLOCKS . . . are the basic standards of precision in thousands of plants. Guaranteed for size, parallelism and flatness within a few millionths of an inch. HOKE Blocks (square type) and USA Blocks (rectangular type) are available in steel or solid carbide.



P & W ELECTROLIMIT MILLIONTH COMPARATOR
. . . was developed by Pratt & Whitney for checking Precision Gage Blocks to a millionth of an inch. An essential item of basic measuring equipment for every plant that must establish and maintain truly high master standards of accuracy.

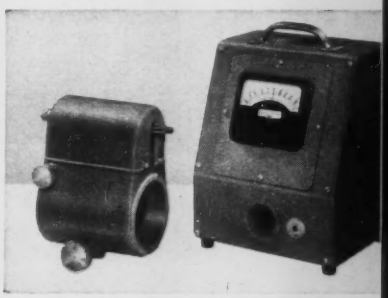
More Effective QUALITY CONTROL *for* HIGH PRECISION PRODUCTION

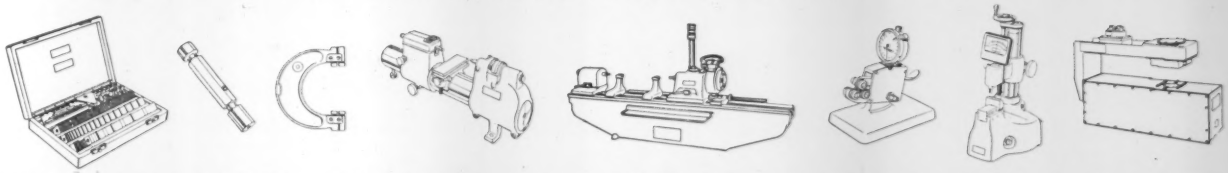
. . . BECAUSE THE *NEW* P & W *ELECTROLIMIT* SUPERMICROMETER IS *EASIER* TO READ *MORE ACCURATELY!*

Equipped with an Electrolimit Tailstock and a high magnification instrument cabinet, the operator can see *at a glance* exactly how much a part is over or under the required dimension. When used as a comparator, deviations are read directly to .00002" on the meter, which has a full scale of .001". The Supermicrometer is now an even more effective means of eliminating errors and reducing scrap losses from high-precision work. Particularly useful for process and final inspection, the Electrolimit "Supermike" is also ideal for use at the machine on lapping, fine grinding and other precision work.

CONVERT YOUR OWN SUPERMICROMETER . . . to an Electrolimit type with packaged unit shown here. Conversion is simply a matter of replacing the old tailstock with the new Electrolimit type.

Write now for complete information about the new P & W Electrolimit Supermicrometer or the Electrolimit Conversion Package. Pratt & Whitney Company, Incorporated, 13 Charter Oak Boulevard, West Hartford, Conn.





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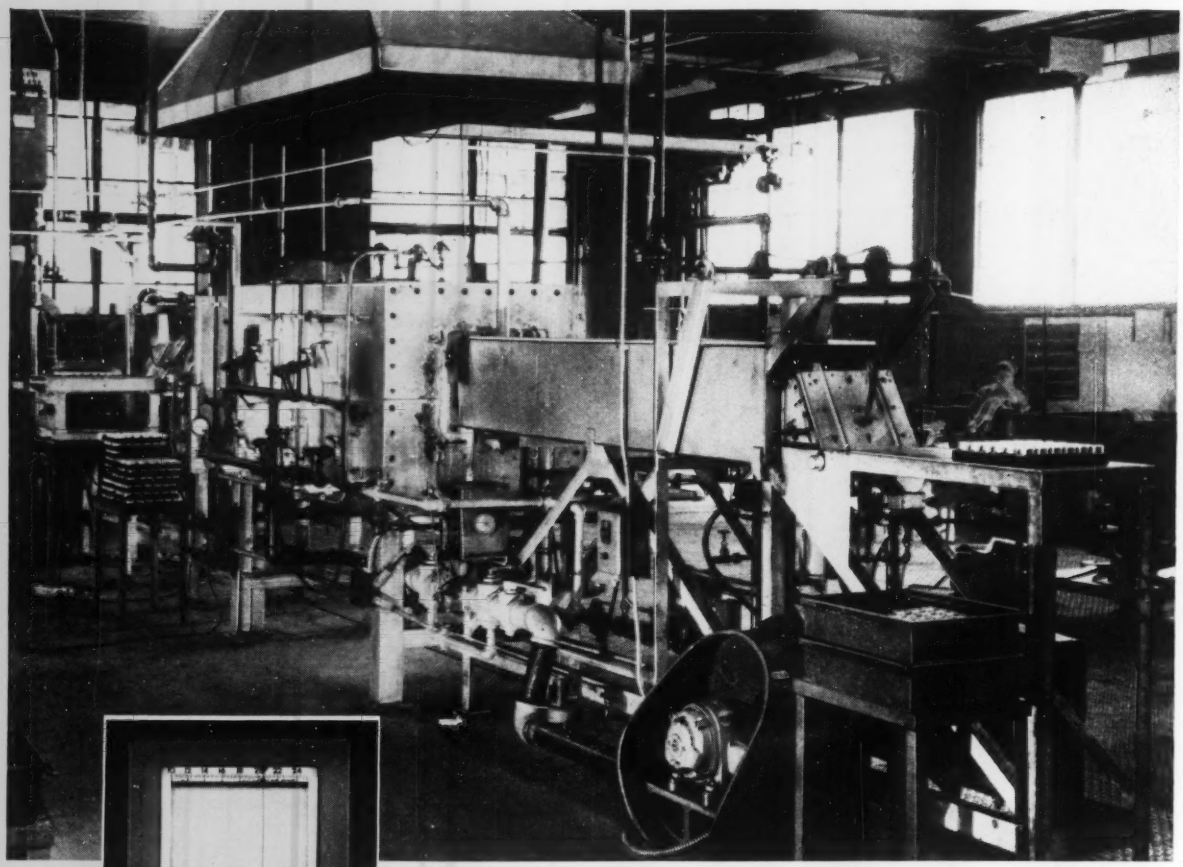
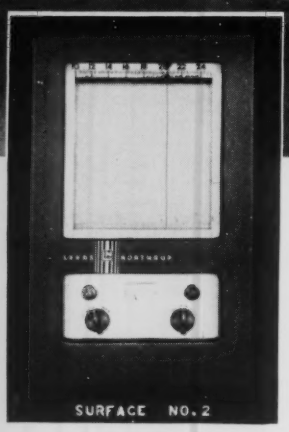




Speedomax® H . . . holds critical sintering temperatures in line at Burgess-Norton

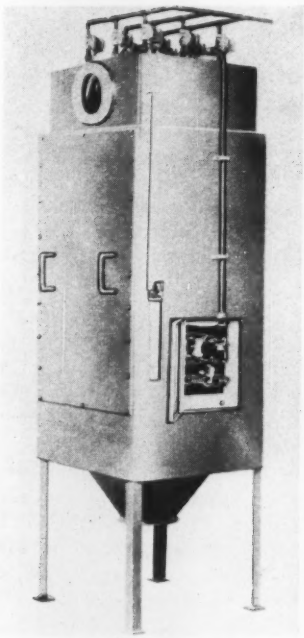
Mix . . . press to a density between 6.2 and 6.6 gms/cc . . . and sinter under good conditions for fifteen minutes at temperature! That's the formula for quality sintered steel parts at Burgess-Norton where many millions of such parts—ranging from small bushings to 4″ diameter gears—are turned out a year. Most of these parts are used "as sintered." Some may be further hardened, carburized or plated.

Good sintering conditions include a sintering furnace, like the Surface Combustion furnace shown, and straight-line control of the critical zone as provided by the Speedomax H controller above. An ammonia dissociator, also under L&N temperature control, provides the neutral atmosphere for the sintering furnace.

One of the most important determinations of the sintering process is temperature. If temperature is too high or too low, size and strength will be adversely affected. With Speedomax H 3-Action Position-Adjusting Type control, the sintering temperature is held well within critical limits . . . practically eliminating rejects due to improper sintering.

When installing your next heat treating furnace—whether it's electric or fuel-fired, continuous or batch—it'll pay you to investigate Speedomax H control. A phone call or letter to your nearest L&N office—or to 4957 Stenton Ave., Philadelphia 44, Pa.—will bring more information.

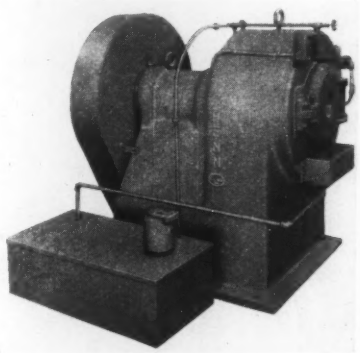
LEEDS NORTHRUP
Instruments Automatic Controls • Furnaces



ments. *Write*: Pulverizing Machinery Division, Metals Disintegrating Co. Inc., Chatham road, Summit, N. J., *Phone*: Crestview 6-6360

Swaging Machine

This machine will produce tapers up to 15 in. long on tubing with a maximum diameter of 2¼-in.



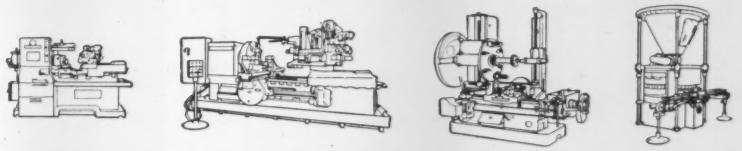
It is used for welded and seamless tubing of ferrous and nonferrous materials. *Write*: Fenn Mfg. Co., Fenn road, Newington, Conn. *Phone*: Mohawk 6-2471

Hydraulic Cylinders

Rated for operation at 2000 psi and higher, these cylinders are

. . . and INCREASED PRODUCTION 45%!"

As part of a complete plant modernization program, the American Bosch Arma Corporation recently replaced 4 hand turret lathes (*2 machines on a 2-shift basis) with 2 Potter & Johnson 3-U Automatics to produce hard Nitralloy parts requiring 25 turning, facing, boring and forming cuts. Output is increased 45%, and *one* operator on *one shift* handles *both* P&J Automatics . . . releasing 3 machinists for other work. In addition, smoothness and accuracy are improved, with rejects reduced to an absolute minimum. If you are using hand lathes, you may be missing opportunities for cost savings and production gains. Write now for "34 Practical Production Ideas," information that shows how your jobs can be done the finer, faster P&J *AUTOMATIC* way! Potter & Johnson Company, Pawtucket, Rhode Island.



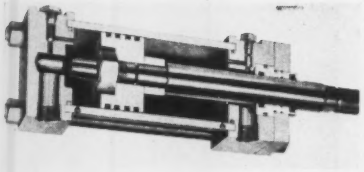
AUTOMATIC TURRET LATHES . . . GEAR CUTTERS . . . GILDA PACKAGING MACHINES

P&J POTTER & JOHNSTON
SUBSIDIARY OF PRATT & WHITNEY COMPANY, INC.
PRECISION PRODUCTION TOOLING SINCE 1898

available in bores ranging from 1½ to 12 in.

The majority of the installations use standard cast iron pistons fitted with alloy step-cut rings. Where piston by-pass is not permitted, a heavy web piston seal with back-up washers is used to assure tight seal.

A synthetic rubber rod wiper prevents air and dirt from being



sucked into the cylinder on the in-stroke and wipes the rod dry on the out-stroke.

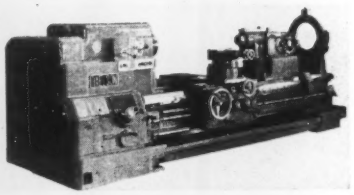
Use of taper cushion plungers on the cylinder rod allows fast cycling and eliminates hammering and vibration.

A choice of 13 standard mountings is offered in all bore sizes. *Write*: Hydro-Line Mfg. Co., 5600 Pike Road, Rockford, Ill. *Phone*: 7-5758

Lathe

This lathe swings 44 in. over the ways and 31 in. over the cross slide. It is equipped with a 75-hp motor capable of developing over 100 hp for peak loads.

The headstock controls provide spindle speeds from 7 to 650 rpm.

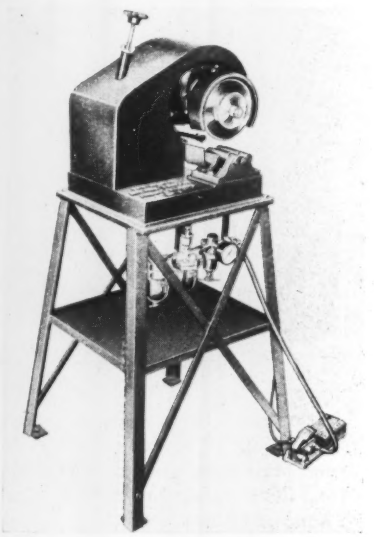


The totally enclosed gearbox provides 61 feeds and 45 leads. *Write*: Axelson Mfg. Co., 6160 S. Boyle Ave., Los Angeles 58, Calif. *Phone*: Ludlow 7-1271

Cutoff Machine

Pipes and tubes ranging from ⅜ to 1¼-in. OD can be cut at the rate of 2000 pieces an hour by this rotary cutoff machine.

The operator feeds the pipe or tube to a stop, presses the air valve foot switch and the blade descends at the desired cutting speed.



A clean, smooth edge is left by the cutter. *Write*: Continental Machine Co., 1952 N. Maud Ave., Chicago 14, Ill. *Phone*: Diversey 8-6596

The shot in the arm!
Engineering!
Building any kind of a heat enclosure? Then be sure to call in a specialist. He's the one who has the engineering "know how"—the one who provides the shot in the arm.
And that shot in the arm—engineering—is the vital factor which assures the life of the installation.
Bigelow-Liptak has a team of that kind of engineer. Every job—big or little—is engineered to the "nth" degree. Sound engineering—coupled with top materials and B-L's unique, unit-suspended construction—gives you a job you can be sure of . . . one that has the stand-up stamina for tough, every-day going . . . one that costs less in the long run.
Applications? Whenever heat must be controlled: for boiler settings, oil stills, cat crackers, metallurgical furnaces, driers, kilns, incinerators. You can get more information on how to give your "coming up" installation a shot in the arm if you write—today!

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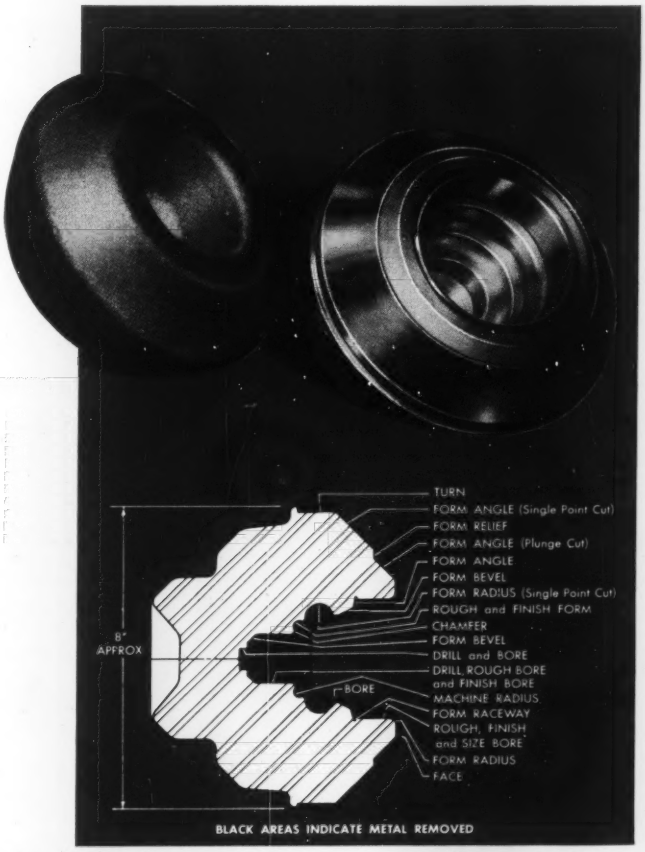


Let me show you how one of our P & J Automatics

handled this tough steel forging and . . .

COMPLETED 24 CUTS IN 3.31 MINUTES!

Performance, like that shown in "JOB FACTS" at the right, is the result of *many* contributing factors. The ability to handle all these varied cuts – including an intricate single-point internal form cut and a hard-to-machine bevel – takes ingenious tooling like that engineered for this job by P&J Tooling Specialists and a versatile machine with a wide range of automatic speeds and feeds. Removing heavy metal fast takes extra power. Holding close tolerances and producing fine micro-finishes demands high precision and rigidity. The Potter & Johnston 4-U – like every automatic in our complete line – gives you *all* these important advanced-design features.

HERE ARE THE JOB FACTS:

PART: *Cutter Bit*

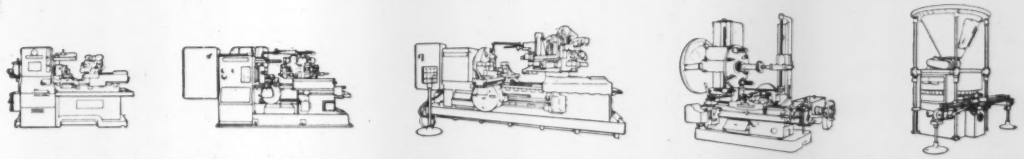
MATERIAL: *4815 Steel Forging*

MACHINING REQUIRED: *24 separate cuts, involving heavy metal removal by drilling, boring, turning, single-point forming and plunge cut forming.*

SPECIAL REQUIREMENTS: *Forming a difficult internal radius and bevel angle with both requiring fine micro-finish.*

RESULTS: *All this accomplished in a single, fully-automatic cycle . . . machining time just 3.31 minutes . . . on a P&J 4-U Automatic Turret Lathe.*

Put all these cost cutting factors to work in your plant – by putting your tough jobs on a P&J Automatic with P&J Tooling – to increase output and up-grade work quality. Let me help you. Just send me your sample parts or prints. Write to Potter & Johnston Company, Pawtucket, Rhode Island.



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NEW literature

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Fasteners

Precision aircraft fasteners for airframe and engine use are described in a 4-page bulletin, form 2245. The self-locking principle is described in a 16-page bulletin, form 2234. A 4-page bulletin, form 2249, shows how precision locknuts are constructed and applied. Standard Pressed Steel Co., Box 579, Jenkintown, Pa.

Saws

Bulletin MS 500 describes saws for metalworking. Huther Bros. Saw Mfg. Co. Inc., 1290 University Ave., Rochester 7, N.Y.

Welding Positioners

Headstock and tailstock welding positioners are covered in this 12-page bulletin, HTS 57. It describes eight models ranging from 5000 to 160,000 lb capacity. Aronson Machine Co., Arcade, N.Y.

Grinding Machine

Specifications for an automatic crankpin grinding machine are included in this 16-page bulletin, 2350-1. Norton Co., Worcester 6, Mass.

Thermostat

A high capacity gas thermostat for use in commercial and industrial equipment is described in this bulletin, RT-815. Robertshaw-Fulton Controls Co., 110 E. Otterman St., Greensburg, Pa.

Resistor Alloy

Specifications for 54 wire sizes and 31 ribbon sizes are given in this 8-page bulletin M-56C-N. Hoskins Mfg. Co., 4445 Lawton Ave., Detroit 8, Mich.

Grinding Wheels

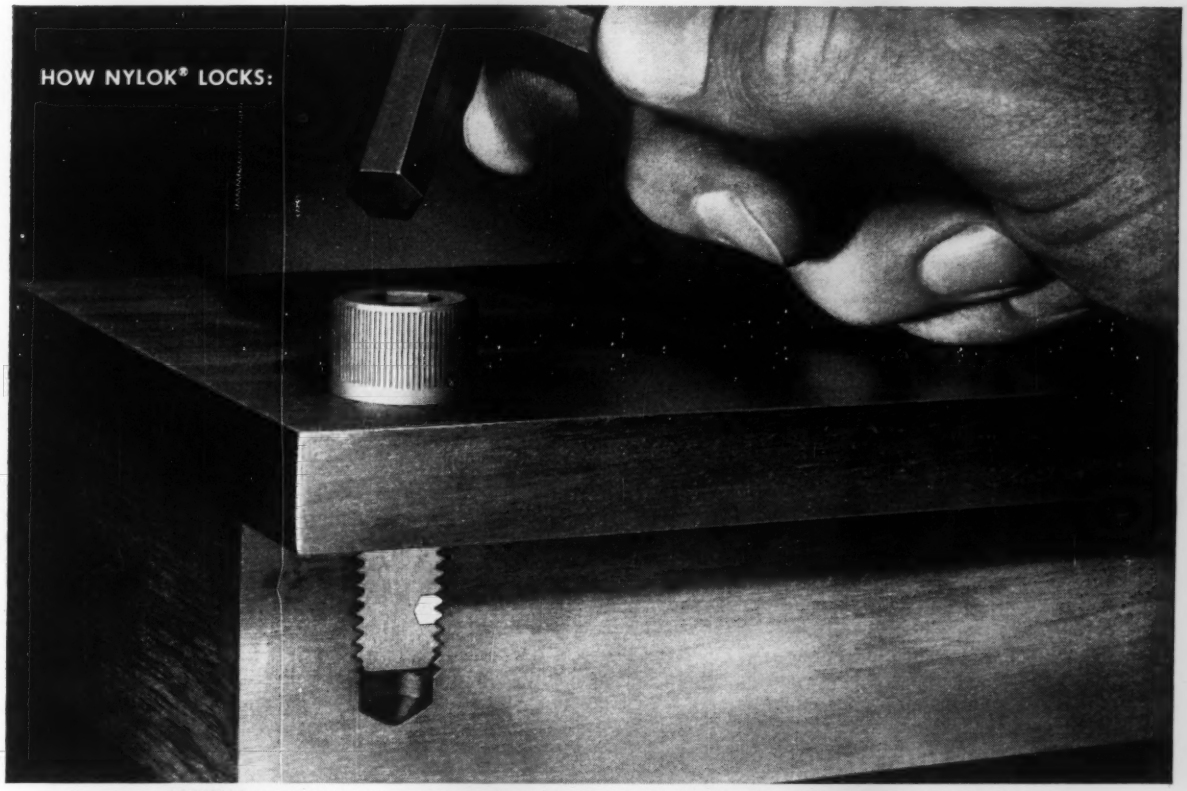
Mounted wheels in all industrial shapes and sizes are described by this wall chart and descriptive folder. Bonded Abrasives Division, Carborundum Co., Niagara Falls, N.Y.

Belting

Hinged-steel belting is described in this 6-page bulletin, MF 600. May-Fran Engineering Inc., 1725 Clarkstone Road, Cleveland 12, O.

Grinding Wheels

This 76-page booklet, R 45-57, contains the recommended standards for grinding wheels. It defines the shape types and sizes of grinding wheels



LOCKED! The tough, resilient nylon pellet keys itself into the mating threads. It forces threads together, and locks the screw securely.

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They simplify design and save production time

UNBRAKO socket screws are now available embodying the Nylok self-locking principle. Nylok provides a truly practical new solution to the problem of making screws self-locking.

You save production time when you build products with self-locking UNBRAKOS. And you get greater simplicity in design with less bulk and weight. The number of parts you must assemble to achieve full locking action is reduced to the absolute minimum. Lockwashers under screw heads are no longer necessary. Costly wiring of cross drilled heads is eliminated. So are cotter pins and complex multiple set screw installations.

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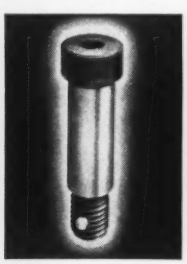
UNBRAKO SOCKET SCREW DIVISION

STANDARD PRESSED STEEL CO.

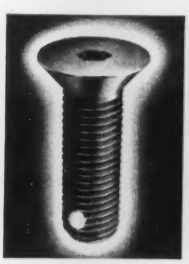
SPS

JENKINTOWN PENNSYLVANIA

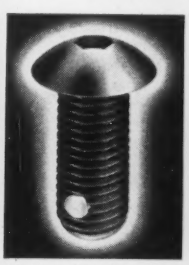
Socket head cap screws. Standard sizes #6 to 1 in.



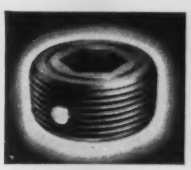
Socket shoulder screws. Standard sizes ¼ to ¾ in.



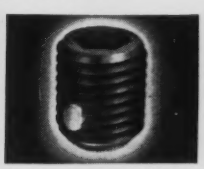
Flat head socket screws. Standard sizes #6 to ¾ in.



Button head socket screws. #6 to ⅝ in.



Socket pressure plugs. Standard sizes ⅛ to 1¼ in.



Socket set screws. All standard point types. #6 to 1 in.

that are in general production and demand. Grinding Wheel Institute, 2130 Keith Bldg., Cleveland 15, O.

Dust Control

Bulletin 274B, 16 pages, discusses the operation of a dust collector. It explains the addition of a water spray to the basic principle of dynamic precipitation. American Air Filter Co. Inc., 215 Central Ave., Louisville, Ky.

Hexagon Nuts

This 16-page bulletin contains the descriptions of sizes from ¼ to 3 in. A guide chart for calculating wrench torques is included. National Machine Products Co., Utica, Mich.

Induction Heaters

A guide to induction brazing and soldering is included in this 8-page bulletin, EH 57-6. Magnethermic Corp., Youngstown, O.

Cranes

This 12-page bulletin describes a 500-ton crane for handling 375-ton heats of metal. Morgan Engineering Co., Alliance, O.

Industry Statistics

Charts are used to display the significant iron and steel industry statistics. This 72-page booklet includes information on steelmaking raw materials, distribution of steel products and the industry's financial affairs. American Iron & Steel Institute, 150 E. 42nd St., New York 17, N.Y.

Welding

Automatic electrodes are described in this 8-page bulletin, SB 1354. Lincoln Electric Co., Cleveland, O.

Lubrication

Three basic elements of automatic lubrication (lubricators, distribution systems and meter units) are described in this 4-page bulletin. Bijur Lubricating Corp., 151 W. Passaic St., Rochelle Park, N. J.

Silicone Rubber

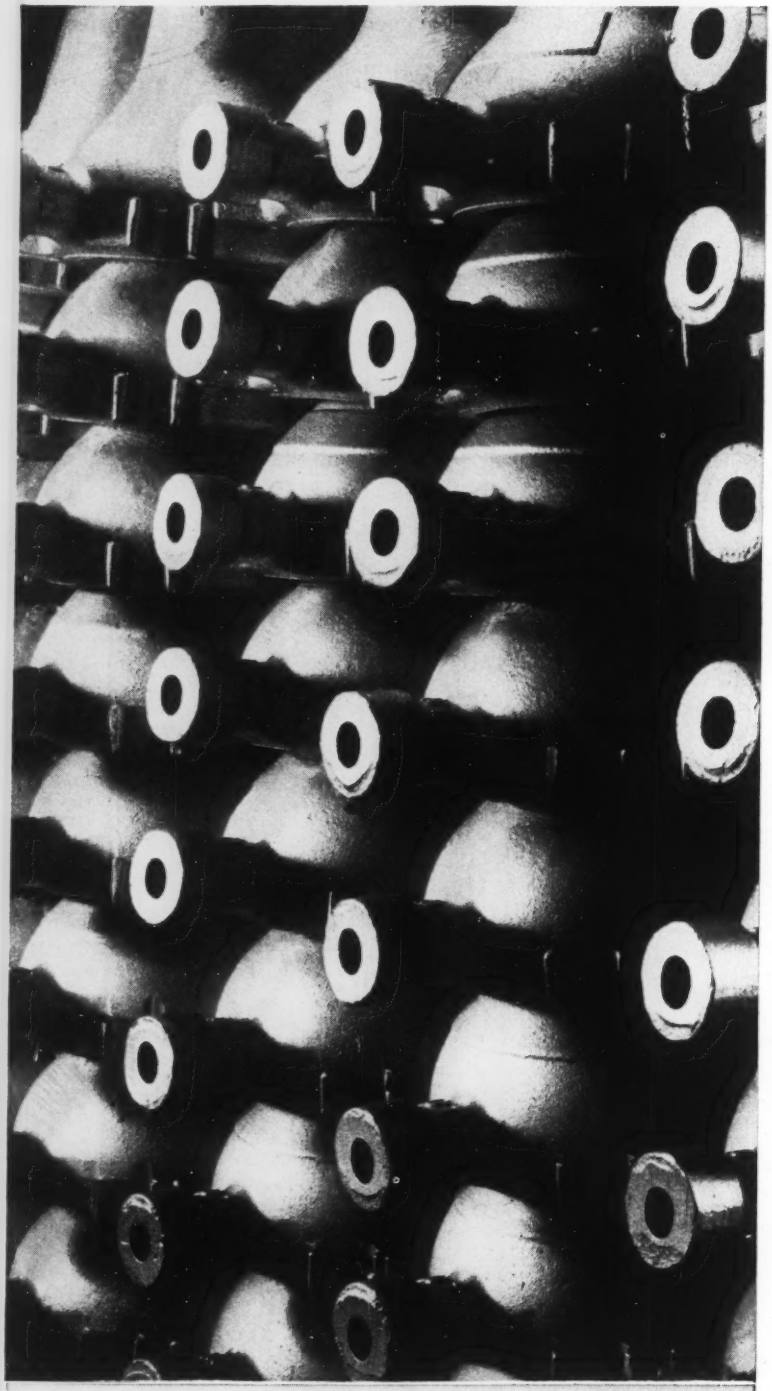
Applications for this rubber are described in this 6-page bulletin, 9-106. Dow Corning Corp., Midland, Mich.

Stainless Steel

Characteristics of three major types of stainless steels are outlined in this 16-page bulletin, G-22. Allen Mfg. Co., Hartford 2, Conn.

Pinhole Detector

Bulletin 6520A, 4 pages, describes how a pinhole detector inspects metal



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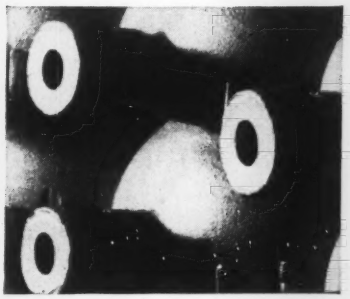

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NEW LITERATURE

strips, moving up to 2000 ft a minute. General Electric Co., Schenectady 5, N. Y.

Plastic Pipe

Pressure - temperature charts, chemical resistance tables, and uses of polyvinyl chloride pipe and fittings are given in a booklet. Tube Turns Plastics Inc., 2929 Magazine St., Louisville 11, Ky.

Production Grinders

Toolroom and production grinders are described in this 6-page bulletin, 618. Reid Bros. Co. Inc., Beverly, Mass.

Machining Steels

Bulletin 99-1, 4 pages, describes 20 types of carbon, alloy and stainless steels with machining characteristics. Joseph T. Ryerson & Son Inc., Box 8000-A, Chicago 80, Ill.

Locknuts

This bulletin reviews the characteristics of light self-locking nuts. Standard Pressed Steel Co., Box 579, Jenkintown, Pa.

NEW BOOKS

Phase Diagrams in Metallurgy, Frederick N. Rhines, McGraw-Hill Book Co. Inc., 330 W. 42nd St., New York 36, N. Y. 340 pages, $12.00.

Phase diagrams are approached from their structure and use rather than their determination. Metallurgical examples are used in all the illustrations. The treatment of thermodynamic principles is reduced to a minimum and emphasis is placed on equilibrium states which are of special interest to metallurgists.

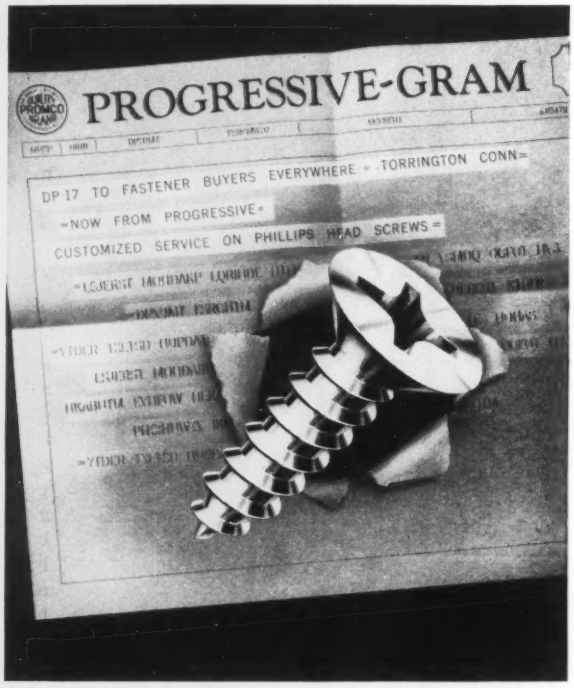
Fundamentals of Welding, Arthur L. Phillips, American Welding Society, 33 W. 39th St., New York 18, N. Y. 560 pages, $9.00.

This is the first section of the Fourth Edition of the Welding Handbook. It contains the basic material needed for all welding activities.

Manual of Instruction for Arc Welding, James F. Lincoln Arc Welding Foundation, Cleveland 17, O. 40 pages, 50 cents.

Explanatory diagrams, illustrations and ideas for useful projects are included in this guide to the basic skills of arc welding. It discusses basic welding techniques and skills, the effect of heat on metals and the preparation of common metals for welding.

The news is really sizzling about...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Market Outlook

STEEL PRODUCTION isn't as brisk as it was early this year, but it's steady. For six consecutive weeks it has hovered around 80 per cent of capacity. In the week ended Aug. 11, the nation's steelmaking furnaces worked at 79 per cent of capacity (just as they did in the preceding week). Helping hold down output in the week ended Aug. 11 was a strike at Great Lakes Steel Corp., Detroit.

AHEAD IN OUTPUT—Although steel output slowed with the approach of summer, production is vastly better than it was last July and August, when a steelworkers' strike held operations down to around 15 per cent of capacity. By the end of this month, the country's steel plants will have turned out more steel for ingots and castings this year than in the corresponding periods of last year or 1955—the record year. Output in the first eight months of 1957 will total around 78.5 million net tons, compared with 72.4 million in the first eight months of 1956 and 75.9 million in the first eight months of 1955.

OBSTACLE—The 1957 figure has been achieved in the face of slack demand from the automobile industry. Steelmakers still find the automotive orders disappointing. These orders are essentially for tonnage to balance out stocks for completion of the current model run. Some orders for preliminary runs on 1958 models are developing, but large tonnages are not expected until next month.

TIMETABLE—Automakers' changeover plans indicate many of the 1958 models will reach the market in the last week of October and the first week of November. Present schedules call for introduction in this period of 15 of the industry's 19 makes. Ford's new Edsel line is expected to come out early next month.

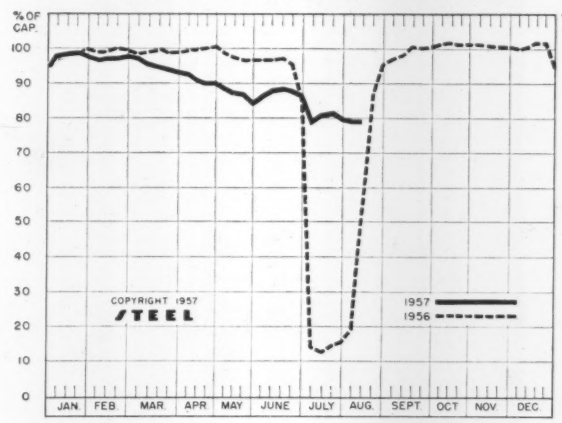
In the farm implement industry there is some strengthening of activity, now that stocks of finished machines have been reduced. The appliance field continues to be marked with lethargy; stocks have not dropped to the point where ambitious production schedules are being planned.

SHOCK ABSORBER—The construction industry has played a big part this year in taking up some of the slack stemming from other steel consuming groups. The threat that construction would be slowed down by a strike in the cement industry evaporated with the end of the work stoppage.

SCRAP PRICE EBBS—With 21 per cent of the country's steelmaking capacity idle, the demand for steelmaking scrap is only moderate. This is reflected in a 67-cent decline in STEEL's price composite on steelmaking scrap in the week ended Aug. 7. At $53.83 a gross ton, the composite is at the lowest level since the first week of June.

COUNTERACTION—Mills consider scrap prices high and are holding down their scrap purchases by substituting as much hot pig iron in their melts as possible. In the first half, the nation's blast furnaces (which make pig iron) ran at 5.3 percentage points above the steelmaking furnaces. At Buffalo, for instance, the steel production rate is 88 per cent of capacity, but pig iron output is at 100 per cent.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Aug. 11	Change	Same Week 1956	Same Week 1955
Pittsburgh	84.5	+ 5*	53	95
Chicago	85	+ 1.5*	57	95
Mid-Atlantic	86	+ 0.5	78	94
Youngstown	81	+ 4	50	100
Wheeling	87	+ 15	73	97.5
Cleveland	84	+ 5*	60.5	97.5
Buffalo	88	0	55	105
Birmingham	85.5	0	15	23
New England	49	+ 1	74	86
Cincinnati	70.5	+ 3*	77	88
St. Louis	85.5	— 1.5	96	98
Detroit	51.5	—38.5*	43	88.5
Western	98	— 1	30	103
National Rate	79	0	52.5	90

INGOT PRODUCTION‡

	Week Ended Aug. 11	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	130.2†	126.6	125.4	88.1
NET TONS (In thousands)	2,092†	2,033	2,015	1,415

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

GET SQUARE D SAFETY SWITCHES AND BENEFIT FROM THE NEW NEMA STANDARDS

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Square D's quick change to the new standards gives you the performance and safety which NEMA standards assure.

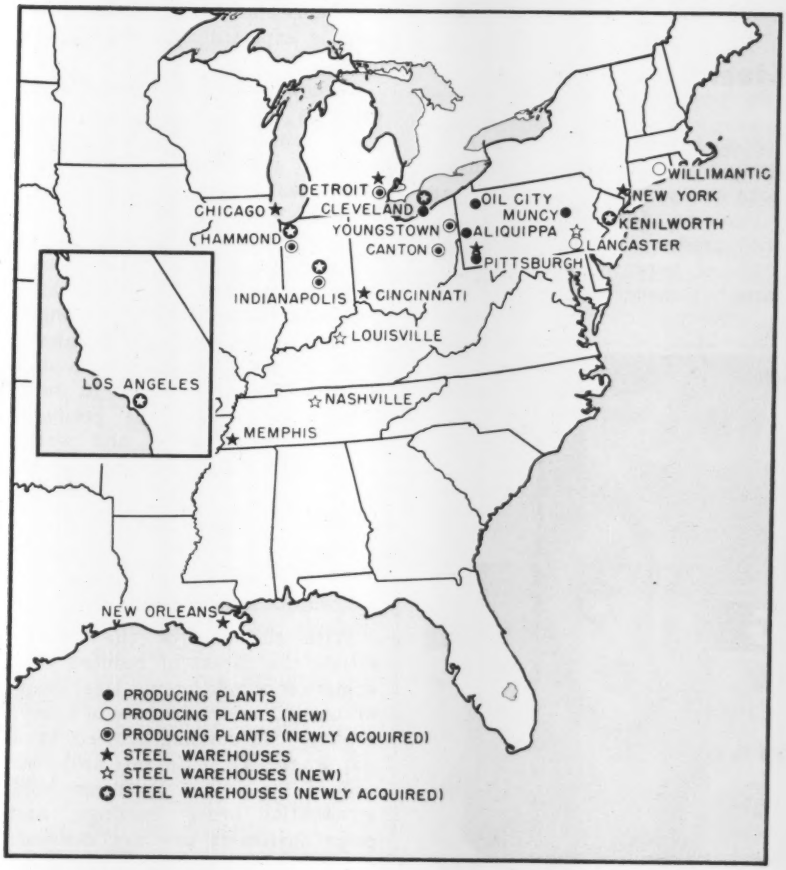
Square D Safety Switches cost no more —why settle for less?

DESCRIPTION	HEAVY DUTY New	NORMAL DUTY formerly Types H, S, or A	LIGHT DUTY formerly Types D or G
Rating-Ampere Voltage	30—600 250 or 600V AC, DC	30—1200 250 or 600V AC, DC	30—200 250V AC
Enclosure	NEMA 12 • Industrial Use (Gasketed) NEMA 4 & 5 • Water-tight & Dust-tight NEMA 7 • Explosion-resisting Class I—Group D NEMA 9 • Explosion-resisting	NEMA 1 • General Purpose NEMA 3R • Raintight	NEMA 1 • General Purpose NEMA 3R • Raintight
Horsepower Rating	NEC Fuse Ratings Dual-Element Fuse Ratings	NEC Fuse Rating Dual-Element Fuse Ratings	NEC Fuse Rating
Operating Mechanism	Quick-Make, Quick-Break Independent of Handle	Quick-Make, Quick-Break Independent of Handle	Positive Make, Positive Break Spring Assisted
Cover	Interlocked & Padlock Attachment	Interlocked & Padlock Attachment	Padlock Attachment
Plating—Current Parts	Extra-Heavy Silver	Silver	
Endurance	Maximum Endurance Far Exceeds UL Standards	Exceeds UL Standards	Meets UL Standards

NOW...EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE

SQUARE D COMPANY

Jones & Laughlin—July, 1952, to July, 1957



GROWTH IN CAPACITY:

Jan. 1, 1958—7,800,000 ingot tons* **Jan. 1, 1953—6,166,500 ingot tons**

Jan. 1, 1957—6,600,000 ingot tons **Jan. 1, 1946—4,741,000 ingot tons**

*Predicted.
1958 figure includes 300,000 tons at Rotary Electric Steel Co.

J&L Spreads Out

JONES & LAUGHLIN Steel Corp., Pittsburgh, literally has spread itself all over the map above in a successful drive to shed its dependency on a few carbon steel products and a few leading markets.

Seven years ago, 75 per cent of J&L's output consisted of hot and cold-rolled sheets, tubular products and bars. If any of those markets slumped, the firm's operating rate dropped an alarming degree. Not so today. Last year, when automotive demand fell off, that industry took only 22 per cent of J&L's shipments, compared with as much as 29 per cent in 1955. Yet, output decreased only 2 per cent, despite a 34-day strike. Increased sales of pipe, tin plate, light structurals, and light plates kept the company's operating rate at 97 per cent of capacity, well above the national rate of about 90 per cent.

How It Happened—J&L grew to its present favorable position by a series of steps, although each move was part of a single design. Basic in that design were management decisions to: 1. Make product mix more flexible. 2. Achieve balance between ingot and rolling mill capacity. 3. Enter several new, fast-growing markets. Officials decided the quickest, and sometimes cheapest, method of expansion was through acquisition of facilities rather than building. Of all the facilities indicated above, J&L built only a cold-finished bar plant in Willimantic, Conn.; a warehouse and container plant in Lancaster, Pa.; and warehouses in Nashville, Tenn., and Louisville.

Liberal additions of new products—galvanized sheets, cold-rolled strip, stainless steel, and cold-drawn extruded shapes—sweetened the product mix. The corporation rounded out its tubular products. With new rolling mill capacity, such as the 44-in. strip mill and electricweld pipe mill now being installed at Aliquippa, Pa., J&L solved many of its problems.

The firm is one of the first to make tin plate in coils.

What It Will Mean—In describing advantages of new product lines, President Avery C. Adams says: "J&L's product mix will have improved substantially when our present expansion program is completed. We are upgrading our products, giving us a higher average selling price and potentially larger profit margin. With additional tubular and flat-rolled capacity and new capacity for stainless steel products, our earnings should increase."

On Jan. 1, 1953, J&L owned seven steel warehouses. Since then, it has built three more and bought five. Specialty metal warehouses at Kenilworth, N. J., and Los Angeles were added when J&L bought Cold Metal Products Co., Youngstown, this year. In 1955, purchase of W. J. Holliday & Co. Inc. gave it warehouses in Indianapolis and Hammond, Ind. Purchase of Hamilton Steel Co. gave it a new warehouse in Cleveland.

Two of three new mill products were added by acquisition of other firms. J&L opened a continuous hot galvanizing line for sheets at Pittsburgh in 1955. Merger with Rotary Electric Steel Co., Detroit, marked the company's entry into

the fast growing stainless field. Acquisition of Cold Metal Products put J&L into the cold-rolled strip business. Other purchases resulted in a cold-finished bar mill in Hammond, Ind. (formerly Monarch Steel Co. Inc.) and a property in Canton, Ohio, where it will install stainless sheet production equipment purchased from Louis Berkman Co.

Where Next?—Looking farther into the future, last month J&L bought property in Chambers County, Tex., which is "ideally suited for construction of a steel mill."

Steel Bars . . .

Bar Prices, Page 181

Steel bar demand appears to be firming up. Cold-rolled specifications are more active. So are requirements for cold-drawn and alloy grades. There is some evidence of improved activity in the farm implement industry, now that stocks of finished machines have been reduced. They are now taking more alloy bars, and their take is expected to increase next month.

Carbon barmakers expect August sales to top those of July by a small margin. But they think demand will be stronger next month as orders from the auto builders begin to swell backlogs. Current automotive demand is slow. No gain in sales of cold-drawn bars to such consumers as the machine tool makers and textile machinery builders is yet seen. Cold-drawers think August business will be only slightly better than that in July, though screw machine products makers, forge shops and warehouses are showing more interest in their needs. The bulk of tonnage is for September shipment.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 181

With the end of the cement strike, the threat of reduced consumption of reinforcing steel evaporates. Concrete bar use is heavy, though road building projects have not progressed at the rate projected earlier this year. Producers hold substantial order backlogs, and some customers are now demanding quick deliveries. Mills that had experienced slowdowns in orders during the cement strike are hard-pressed to raise production and speed shipments.

No general shortage of reinforcing bars is seen, once the mills get into full production. Available bar capacity is said to be adequate because of the dull demand for commercial bars. One Pittsburgh producer thinks August will be the largest production month so far this year.

Wire . . .

Wire Prices, Pages 183 & 184

Where wire consumers have covered their needs for the remainder of the third quarter, shipping specifications in the East for September are heavier than they were for August. The pickup this month over July volume is slight, and both primary and finishing operations are lower in some cases than before vacation shutdowns.

Inventory conditions are spotty.

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Tested across the country by practical, critical, hard-bitten working weldors, here's what they say about the new Miller GOLD STAR SR:
"it's the DC performance I've always wanted"
"here's DC welding current that's . . . perfect!"
"positively handles ALL electrodes better"
"best deal I've seen for v and o work"
"easiet arc starting in my experience"
"smoothest arc I ever used . . . and . . . quiet!"
* "it's just plain the MOST"
Complete particulars on the MILLER GOLD STAR SR, including inert gas and automatic fixture welding, is now available on request.

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miller Electric Manufacturing Company, Inc.
APPLETON, WISCONSIN
distributed in Canada by CANADIAN LIQUID AIR CO., LTD., Montreal

Fastener producers are still well stocked, and they are operating hardly better than 50 per cent of capacity. Inventories held by makers of mechanical precision springs are lower. Their sales this year are off about 10 per cent. Furniture spring wire is moving slowly. Automotive requirements are expected to pick up in September.

Tubular Goods . . .

Tubular Goods Prices, Page 185

A major producer of oil country tubular goods in the Pittsburgh area has opened order books for the fourth quarter. It expects demand to be slightly below that in earlier quarters this year, due chiefly to larger inventories in the hands of drillers, a decrease in the number of rigs operating, and seasonal conditions during the period that make for reduced demand, chiefly in the Rockies and Canada.

The pipemaker thinks, though, that it will be able to sell all the tubular goods it can produce, due to steadily expanding foreign demands. In addition, several users have been unable to obtain all the material they sought in earlier quarters, resulting in a backing up of unfilled requirements that will serve to fill gaps in schedules.

Sales of welded pipe and seamless specialties remain slow, but there are signs of an upswing this month in pipe requirements, due to completion of inventory-reduction programs by some buyers.

Plates . . .

Plate Prices, Page 181

Construction companies are struggling to keep their stocks of plates in balance during the height of the construction season. Heavy plate allocations are not increasing, due in part to the adverse effect of the recent hot weather on production. At the same time, plate requirements for repair work are increasingly heavy.

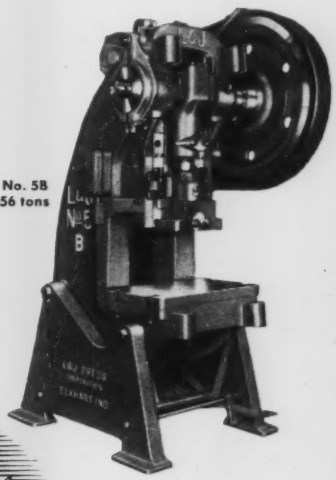
In contrast, light plate supply is beginning to exceed demand. One strip mill in the Pittsburgh district, disappointed by the low volume of strip orders in late third quarter, plans to accept orders for light plate through September. It may accept them into the fourth quarter. With some railroads beginning to reduce their purchases, light plate probably will be in free supply during the remainder of this quarter.

Producers of sheared wide plates in the Philadelphia district who have opened their fourth quarter books have not generally increased allotments. Most of them aim to clear up carryovers of two to three weeks, although demand for heavy quality plates is well diversified.

Despite a greatly improved supply of light strip-mill plates (now showing signs of tightening), fabricating shops have not accumulated large stocks due to width limitations. This applies particularly to tank builders. They do not want to get caught with narrow widths should there be an easing in universal and sheared stock.

Plate fabricating shops are more competitive and are making closer estimates, raising the question of future premium plate prices.

Shipyard plate volume is heavier



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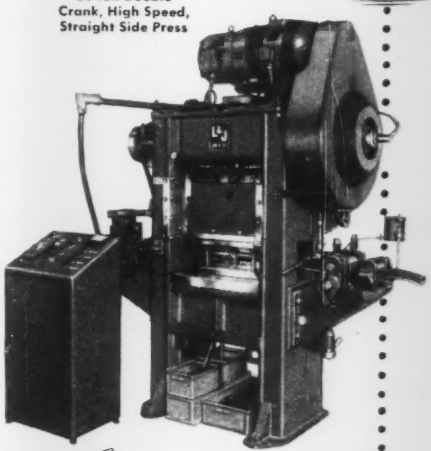
20 ton Double Crank, High Speed, Straight Side Press



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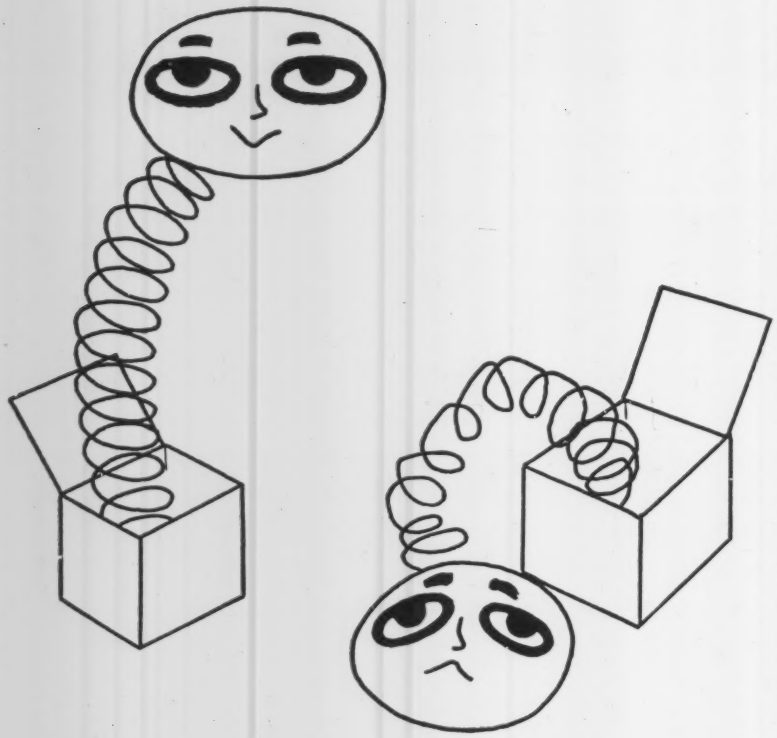

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RIVERSIDE-ALLOY METAL DIVISION

H. K. PORTER COMPANY, INC.

and a substantial tonnage for export has been sold at full premium.

Tool Steel . . .

Tool Steel Prices, Page 185

Shipments of high-speed and tool steel (excluding hollow drill steel) totaled 7989 net tons in June, reports the American Iron & Steel Institute. This compares with 13,149 tons in June a year ago.

First half shipments this year amounted to 56,083 tons, off sharply from the 70,695 tons moved in the like period of last year.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 182 & 183

While improvement in August sheet orders is not up to expectations, demand for cold-rolled tonnage is better than that for hot-rolled. Some orders for preliminary runs on the 1958 model automobiles are developing, but large volume demand is not expected until next month.

Suppliers to two of the three big auto builders are predicting a gain in sales of cold-rolled sheets in early September, but the third auto firm may be slower re-entering the market. As a result, one Pittsburgh area sheet mill thinks it may have excess capacity going into fourth quarter.

The steel mills are doing considerably more selling than was the case last year. The day of sitting back and waiting for orders to roll in is past. This is especially true of the marginal producers.

New England sheet sellers think district volume in sheets and strip this month will be up about 20 per cent compared with July tonnage. Where buyers have covered their needs for the balance of the current quarter, the bulk of specifications is for September delivery.

A slight pickup in galvanized sheet requirements is noted in the East. More prompt shipment tonnage is coming out. Also, culvert sheet volume is heavier. More spot orders also are appearing for enameling stock and other sheet specialties, stainless excepted.

New England shops fabricating galvanized containers, barrels, drums, etc., are reported in a price squeeze, several integrated pro-

ducers having reduced their prices despite the recent increase in galvanized sheet prices.

Warehouse . . .

Warehouse Prices, Page 186

Now that construction activity has reached its seasonal peak, numerous firms are running low on supplies of heavy plates, wide flange beams and reinforcing bars. Buying interest in bars rose markedly as soon as the strike ended in the cement industry. Supplies of heavy structurals are expected to increase in October.

Standard structural shapes and light plates are moving in good volume, but supply is beginning to surpass demand.

The sheet and strip markets are dull. Galvanized sheet business is erratic and some price shading is noted.

Most distributors do not expect a substantial improvement in the over-all demand for steel products until September. They expect August bookings to surpass those in July when plant shutdowns for vacations caused a curtailment in shipments.

In the New York district, distributors are well inventoried except for sheared plates over 72 in. wide. Some had their July allocations reduced 60 per cent and are not back to the original allocation for August.

Pig Iron . . .

Pig Iron Prices, Page 186

Buying interest in pig iron is slightly more active, notably with shops producing heavy steel castings. Shipments are expected to follow a steady uptrend into the fourth quarter. Some sellers experienced a larger volume of business in July than had been figured originally.

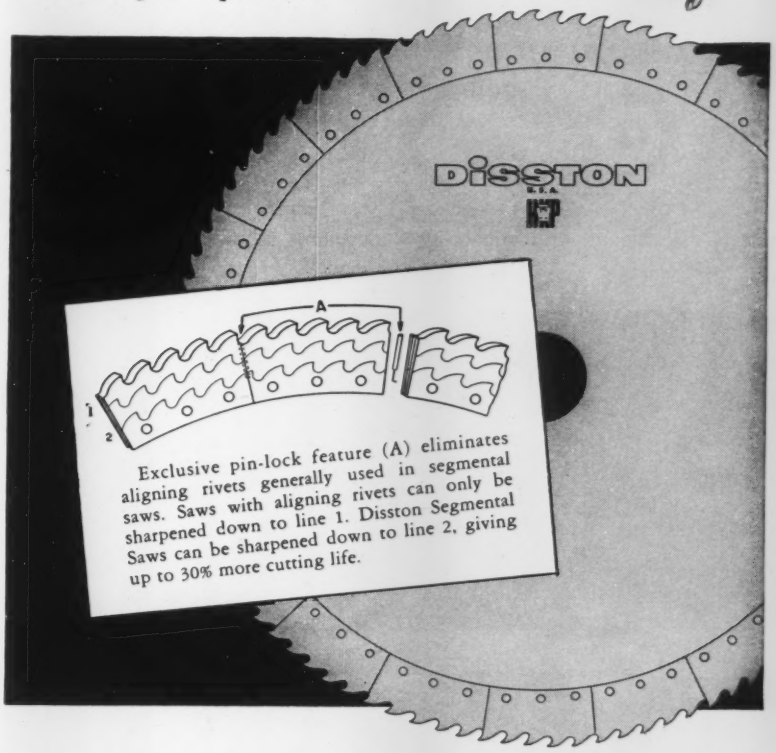
Inventories of pig iron are low and, therefore, heavier buying should develop quickly following any substantial pickup in orders received by foundries.

Castings for the Chrysler tank contract will be poured by General Steel Castings Corp. at Granite City, Ill., instead of Eddystone, Pa.

Steel mills continue to use a high percentage of hot metal in open-hearth melts due to the high price of scrap. As a result, at least one

Increase cutting life up to 30%...with DISSTON SEGMENTAL CIRCULAR SAWS!

Exclusive pin-lock feature *locks* segments together by aligning pins—permanently holding the segments in perfect alignment. Since there are no aligning rivets to limit sharpening, up to 30% more cutting life is possible.



Exclusive pin-lock feature (A) eliminates aligning rivets generally used in segmental saws. Saws with aligning rivets can only be sharpened down to line 1. Disston Segmental Saws can be sharpened down to line 2, giving up to 30% more cutting life.

- Replaceable high-speed steel segments need only infrequent sharpening.
- Narrow kerf assures fast, clean cutting with minimum waste.
- Teeth are accurately indexed so they may be sharpened on automatic machines.
- For cutting ferrous or non-ferrous metals.
- In diameters from 11″ to 63″.

For cutting non-ferrous metals and plastics Disston also manufactures a complete line of solid tooth Diss-croloy and Alloy Circular Saws.

For new literature write to Henry Disston Div., H. K. Porter Company, Inc., Phila. 35, Pa.

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for top quality in "Commercial Grade" Roller Bearings . . . AND NOT GET IT?

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From the simplest steel-cage type to the finest segmented-retainer type, Rollway "commercial grade" Tru-Rol Roller Bearings incorporate as closely as possible design and construction principles found normally in a Rollway maximum-type precision bearing.

Take the segmented-type Tru-Rol for example. Each deep-section separator segment is formed to fit the curvature of the roller. Each roller has a separator segment to keep it in accurate alignment. And each roller is crowned to distribute load evenly along the full length of the roller.

That's a lot different from small-diameter, unground spacers staggered at unequal intervals, resulting in rollers rubbing in opposed-motion, and non-uniform roller distribution that can set up out-of-balance vibration and "pulse".

Let a near-by Rollway Service Engineer consult with you on your bearing problems. No charge. No obligation. Just write us. Rollway Bearing Co., Inc., Syracuse, N. Y., *manufacturers of a complete line of radial and thrust cylindrical roller bearings.*

Cutaway view of Rollway Tru-Rol® segmented-retainer roller bearing one of three distinct types of Tru-Rol bearings available.

ENGINEERING OFFICES: SYRACUSE • BOSTON • CHICAGO • DETROIT • TORONTO • PITTSBURGH • CLEVELAND • MILWAUKEE • SEATTLE • HOUSTON • PHILADELPHIA • LOS ANGELES • SAN FRANCISCO

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Retainer Operation

☐ Is the retainer roller-supported, to reduce sliding friction?

Retainer Construction

☐ Is the retainer strong enough to withstand shock loads and sudden reversals?

(A Rollway segmented-type steel retainer, such as that illustrated, is the strongest, most durable available in commercial grade bearings.)

Roller Spacing

☐ Are all rollers equally separated, or do some rub against each other in opposed-motion friction?

☐ Are rollers distributed evenly to prevent "pulse" and vibration?

Roller Construction

☐ Are the rollers crowned for optimum load distribution?

For Top Quality in Every Detail Buy Tru-Rol and Be Sure!

large mill in the Buffalo district has virtually no iron available for the merchant market.

Iron Ore . . .

Iron Ore Prices, Page 187

Receipts of iron ore and ore agglomerates in the second quarter of this year totaled 41,934,511 gross tons, reports the American Iron Ore Association. This was up slightly from the 41,692,046 tons received in the like 1956 period. Sources: U. S. Lake Superior, 27,513,508 against 28,743,736; other U. S. ores, 5,093,131 against 4,861,913; Canadian Lake Superior, 1,099,839 against 965,193; other Canadian, 2,487,822 against 2,483,807; foreign 5,740,211 against 4,637,397.

Stocks of ore at the end of second quarter totaled 41,201,237 tons against 39,484,652 at the end of the same quarter last year. Broken down by source: U. S. Lake Superior, 28,409,328 against 29,965,742 at the end of second quarter last year; other U. S., 3,317,500 against 2,620,610; Canadian Lake Superior, 1,160,454 against 869,281; other Canadian, 3,184,939 against 2,320,856; foreign, 5,129,016 against 3,708,163.

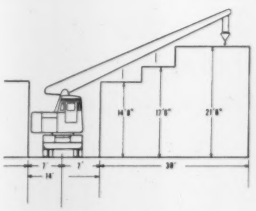
Quarterly consumption was 33,660,336 tons against 32,939,640 a year ago. The breakdown: U. S. Lake Superior, 20,536,018 against 21,698,827; other U. S., 5,149,860 against 4,644,907; Canadian Lake Superior, 928,242 against 864,664; other Canadian, 2,340,330 against 1,808,043; foreign (except Canada), 4,705,886 against 3,923,199.

April imports of iron ore totaled 1,800,720 gross tons, valued at $16,176,040, reports the U. S. Bureau of Mines. This brought the total imports in the first four months this year to 6,307,958 tons, valued at $52,693,713.

Shipments of Lake Superior iron ore in the week ended Aug. 5 totaled 3,165,304 gross tons, reports the American Iron Ore Association. This compares with 254,227 tons in the corresponding week a year ago when lake traffic was tied up by the steel strike. Cumulative shipments to Aug. 5 for the 1957 season are 46,430,352 tons against 33,991,602 last year.

The nation's busiest ore unloading port, U. S. Steel's Pittsburgh & Conneaut Dock Co. at Conne-

Just one trip down a narrow aisle and you'll be married to your Coles Crane



Short, compact chassis, and cantilever boom on high A-frame permits close-quarter maneuverability, high stacking and full use of cubic storage area.

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WRITE FOR BOOKLET "101 Cost-Cutting Ways"

Now, available L.P.G.-, diesel-, or gasoline-electric powered in capacities from 5 to 50 tons. Available on long term lease arrangements.

aut, O., established an all-time high mark during July, handling 2,119,169 gross tons of iron ore.

Structural Shapes . . .

Structural Shape Prices, Page 181

Sustained demand for structurals has slowed down the easing in plain material, notably wide flange sections, evident in the market lately. For September shipment, one leading producer has cut back slightly on shipments.

Shop backlogs extend into 1958 in some cases, though the smaller shops can take medium-size tonnages for shipments in five to six months, mostly where light sections are required. Less tonnage is being estimated for fabricating, and fabricated prices are not fully following the general upward trend in construction material costs. Prices are recovering slowly from the recent softening in New England.

Bookings by New England fabricators are slowed by strikes. This has eased pressure for plain material in the area, except from shops not affected. A bulge in district bridge work, largely in Connecticut, is estimated to involve 10,000 tons, including the superstructure for the Connecticut river bridge at Wethersfield.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5000 tons, factory, office and service buildings, Western Electric Co., Columbus, O., to Allied Structural Steel Co., Chicago, direct to owner; Turner Construction Co., New York, is general supervising contractor.

3315 tons, including 1805 tons of low alloy, superstructure, steel girder bridge, Anacostia freeway over the P. B. & W. railroad yards, Washington, D. C., contract No. 2 to American Bridge Division, U. S. Steel Corp., Pittsburgh; Terry Contracting Co., New York, general contractor.

900 tons, maintenance hangar, air station, Beaufort, S. C., to Aetna Steel Co., Jacksonville, Fla.; Ruscon Construction Co., Charleston, S. C., general contractor; 50 tons of reinforcing bars to the Ceco Steel Products Inc., Charleston.

550 tons, state highway bridges, Warwick-East Greenwich, R. I., to Tower Iron Works, Providence, R. I.; Monroe-Langstroth Co., Norwood, Mass., general contractor.

500 tons, mill building, U. S. Steel Corp. Duquesne, Pa., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

400 tons, electronics laboratory, RCA Defense Electronics Division, Burlington, Mass., to the A. O. Wilson Structural Co., Cambridge, Mass.; Turner Construction Co., Boston and New York, is general contractor.

400 tons, dairy plant, Spokane, Wash., to Union Works, Spokane.

385 tons, state highway bridges, Andover, Mass., to Tower Iron Works, Providence.

350 tons, airport terminal, Scranton-Wilkes-Barre, Pa., to the Ostrander Iron Works, Wilkes-Barre.

250 tons, Social Science building, University of Connecticut, Storrs, Conn., to Tower Iron Works, Providence, R. I.; Joseph Rugo Inc., Boston, general contractor.

200 tons, dormitory, state college, Raleigh, N. C., to Peden Steel Co., Raleigh; J. M. Thompson Co., Raleigh, general contractor. R. I.; Consolidated Builders Inc., North Attleboro, Mass., general contractor.

150 tons, switchboard structures and equipment, Rocky Reach dam project, to R. & I. E. Equipment Division, I-T-E Circuit Breaker Co., Boston, at $370,900, including miscellaneous items, by Chelan County P.U.D., Wenatchee, Wash.

120 tons, Chilkat river bridge, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons or more, prison equipment, Walla Walla, Wash., to Decatur Iron & Steel Co., Decatur, Ala., low at $284,533.

150 tons, King county, Wash., Skykomish river bridge, to Isaacson Iron Works, Seattle.

100 tons, addition to hospital, Elkton, Md., to Bethlehem Fabricators Inc., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

3500 tons, office building, National Life Insurance Co., Montpelier, Vt.; Gilbane Building Corp., Providence, R. I., general contractor.

2800 tons, roadway and ramp viaducts, Hartford-Springfield expressway, Hartford, Conn.; bids Aug. 19, state project 63-124.

2575 tons, state highway bridges, York county, Pennsylvania, bids Aug. 30, Harrisburg, Pa.

820 tons, two 3-span and two 2-span I-beam highway structures, Brattleboro-Guilford, Vt.; bids Aug. 23, Montpelier, Vt.; also 200 tons of reinforcing bars.

800 tons, state girder bridge, Erie county, Pennsylvania, bids Aug. 30, Harrisburg, Pa.

675 tons, Nisqually river bridge, Rainier National Park; bids to Bureau of Public Roads, Portland, Oreg., Aug. 16; alternatives for prestressed.

500 tons, I-beam bridges, Wayne-Pike counties, Pennsylvania, bids Aug. 30, Harrisburg, Pa.

450 tons, two welded girder bridges, Reading-Woburn-Wilmington, Mass.; Campanella & Cardi Construction Co., Hillsgrove, R. I., $3,392,324.40, low general contract.

150 tons, substation steel, Bethlehem Pacific Coast Steel Corp., San Francisco, low at $46,100 to Bonneville Power Administration.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1200 tons, Sage project, Moses Lake, Wash., to Northwest Steel Rolling Mills Inc., Seattle; Howard S. Wright & Co., jointly with Lease Co. Inc., Seattle, and Hoffman Construction Co., Portland, Oreg., general contractors for Western Electric Co., prime contractor.

360 tons, Social Science building, University of Connecticut, Storrs, Conn., to Scherer Steel Co., Hartford, Conn.; Joseph Rugo Inc., Boston, general contractor.

315 tons, dormitory, state college, Raleigh, N. C., to Easterby & Mumaw, Raleigh; J. M. Thompson Co., Raleigh, general contractor.

290 tons, barracks, Ft. Knox, Ky., to Laclede Steel Co., St. Louis; Struck Construction Co., Louisville, general contractor.

188 tons, telephone building, Glasgow, Mont., and Washington state highway project, to Bethlehem Pacific Coast Steel Corp., Seattle.

180 tons, electrical engineering laboratory, Yale University, New Haven, Conn., to Northeastern Steel Corp., Bridgeport, Conn.; E. & F. Construction Co., Bridgeport, general contractor.

160 tons, Washington state highway project, to Soule Steel Co., Seattle.

RAILS, CARS . . .

RAILROAD CARS PLACED

Central of Georgia, 500 seventy-ton open-top triple hopper cars, to American Car & Foundry Co., New York.

RAILROAD CARS PENDING

Reading, 1000 seventy-ton triple hoppers and 900 seventy-ton all-welded gondolas.

Imported Steel

Prices per 100 lbs. (except where otherwise noted) landed, including customs duty, but no other taxes.

	Atlantic & Gulf Coast	West Coast	Vancouver	Montreal
Deformed Bars (⅜" Dia. incl. all extras)	$6.78	$7.01	$6.76	$6.44
Merchant Bars (¼" Round incl. all extras)...	7.62	7.85	7.48	7.22
Bands (1"x¼"x20' incl. all extras)	7.76	7.98	7.65	7.38
Angles (2"x2"x¼" incl. all extras)	6.57	6.75	6.99	6.69
Beams & Channels (base)	6.82	7.00	7.24	6.94
Furring Channels (C.R. ¾", per 1000')	26.62	27.77	....	....
Barbed Wire (per 82 lb. net reel)	6.95	7.40	7.75	7.80
Nails (bright, common, 20d and heavier)	8.38	8.58	9.07	8.99
Larssen Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's, bright, low C, (11½ga.)	7.38	7.52	8.52	8.52
Wire, galvanized, low C, (11½ ga.)	8.01	8.15	9.42	9.42
Wire, Merchant quality, bl. ann., (10 ga.)...	7.60	7.75	8.78	8.78
Rope Wire (.045", 247,000 PSI, incl. extras)..	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14G, 97 lbs. net)....	9.58	9.73	9.64	9.54
Merchant Pipe (½" galv. T & C, per 100')...	8.48	8.83	....	....
Casing (5½", 15.5 J55, T & C, per 100')	194.00	199.00	.....	....
Tubing (2⅞", 6.4 J55, EUE, per 100')	103.00	104.00	....	....
Forged R Turn. Bars, C-1035 (from 10" dl.).	14.00	14.23	14.00	13.74

Ask prices on: Bulb tees, bolts and nuts, manganese steel plates and shapes, welded wire reinforcing mesh and hardware cloth, boiler tubes, A-335-P11 pressure pipe.

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Through Stahlunion-Export GmbH

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NIEDERRHEIN Europe's most modern Rod Mill—OH, CH, Low Metalloid, Specialty Wire Rod, Merchant Bars.

WESTFAELISCHE UNION Europe's largest Wire Mill—All types drawn Wire and Wire Products—Nails, Barbwire, Wire Rope, Prestress Concrete Wire and Strand.

PHOENIX RHEINROHR Europe's largest Pipe Mill—Pipe, Tubing, Flanges, Welding Fittings, Precision Tubes, Tubular Masts.

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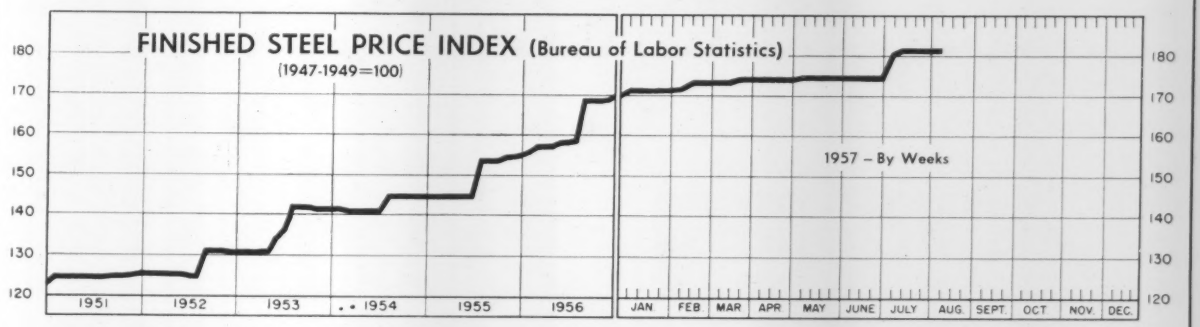
Price Indexes and Composites



Aug. 6, 1957	Week Ago	Month Ago	July Avg.	Year Ago
181.5	181.5	181.4	181.5	166.1

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Aug. 6

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.600	Bars, Reinforcing	6.210
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.00	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.585	Sheets, Electrical	12.108
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon	9.193
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.245
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft)	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundle)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Aug. 7 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	225.71	181.40
Index in cents per lb	6.479	6.479	6.479	6.114	4.914

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$146.19	$146.19	$145.74	$137.75	$113.23
No. 2 Fdry Pig Iron, GT	66.49	66.49	64.70	62.63	52.54
Basic Pig Iron, GT	65.99	65.99	64.23	62.18	52.16
Malleable Pig Iron, GT	67.27	67.27	65.77	63.41	53.27
Steelmaking Scrap, GT	53.83	54.50	55.17	54.83	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Aug. 7 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld., Philadelphia	5.715	5.715	5.715	4.93	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.585	5.585	5.585	5.00	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.50	5.50	5.50	4.80	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.325-5.425	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.75-4.00
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.35	5.30-5.60
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	4.85-5.225
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.35	5.90-6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.85	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, 7/32-5/8" Pitts.	6.15	6.15	6.15	5.80	4.325

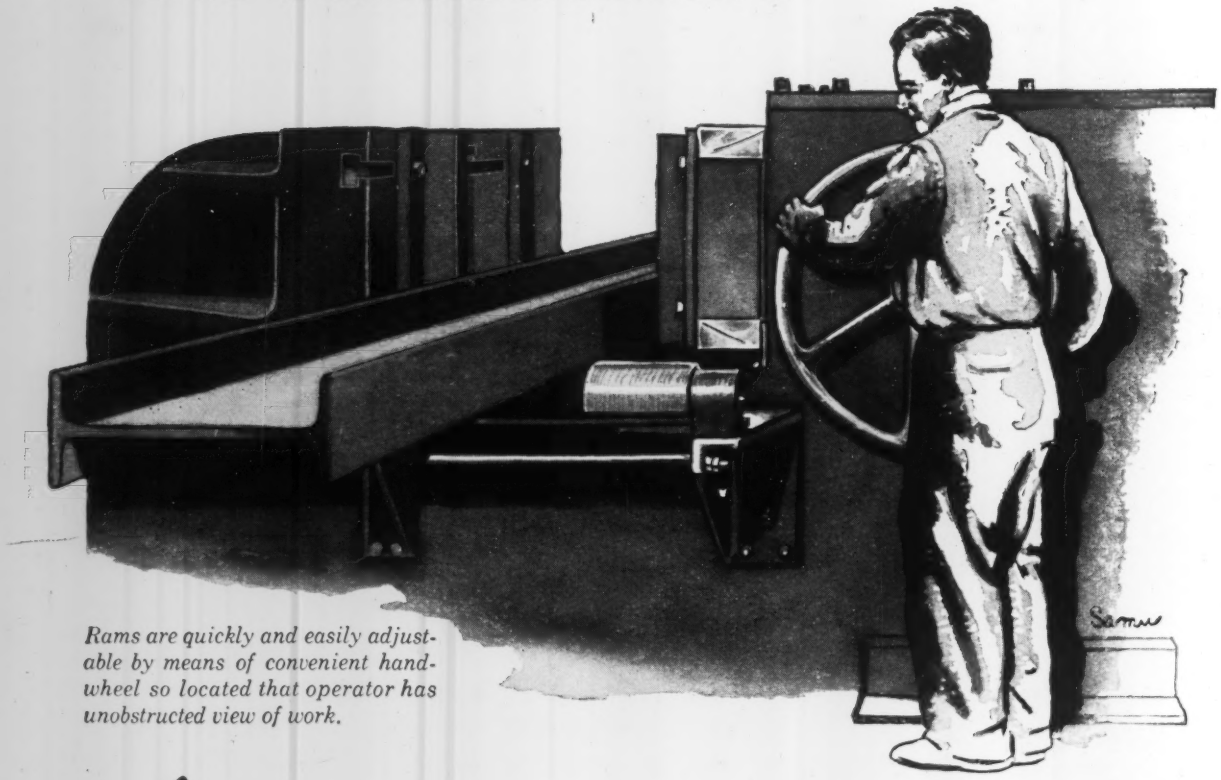
PIG IRON, Gross Ton	Aug. 7 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$65.50	$63.50	$53.00
Basic, Valley	67.00	64.50	64.50	62.50	52.00
Basic, deld., Phila.	69.88	69.88	68.38	66.26	56.75
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	65.00	63.00	52.50
No. 2 Fdry, Chicago	66.50	66.50	65.00	63.00	52.50
No. 2 Fdry, deld., Phila.	70.38	70.38	68.88	66.76	57.25
No. 2 Fdry, Birm.	62.50	62.50	60.25	59.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	66.70	66.70	56.43
Malleable, Valley	66.50	66.50	65.00	63.00	52.50
Malleable, Chicago	66.50	66.50	65.00	63.00	52.50
Ferromanganese, Duquesne	255.00†	255.00†	255.00†	215.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$55.50	$56.50	$56.50	$55.50	$44.00
No. 1 Heavy Melt, E. Pa.	52.00	53.00	56.00	55.00	41.50
No. 1 Heavy Melt, Chicago	54.00	54.00	53.00	54.00	42.50
No. 1 Heavy Melt, Valley	55.50	55.50	54.50	60.50	44.00
No. 1 Heavy Melt, Cleve.	52.50	52.50	51.50	57.50	43.00
No. 1 Heavy Melt, Buffalo	46.50	46.50	46.50	49.50	43.00
Rails, Rerolling, Chicago	79.50	79.50	76.50	75.50	52.50
No. 1 Cast, Chicago	47.50	47.50	47.50	50.50	48.50

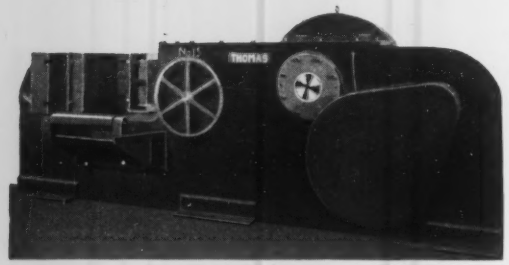
COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$14.125	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.00	16.50	17.00

FOR *Cold* BENDING AND STRAIGHTENING



Rams are quickly and easily adjustable by means of convenient handwheel so located that operator has unobstructed view of work.

of Bars, Billets, Structurals, Rails, etc.



This view of Thomas Bending and Straightening Machine shows operator's side. Thomas engineers have designed this unit to provide maximum performance and minimum operating cost.

The trend is to Thomas

PUNCHES • SHEARS • PRESSES
BENDERS • SPACING TABLES

The Thomas all-steel Bending and Straightening Machine is built in six sizes, varying from 50 to 400 tons. It is clean, modern, streamlined and self-contained, does the job quickly and efficiently, and conserves floor area in your plant.

Write for Bulletin 315.

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

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Steel Prices

Mill prices as reported to STEEL, Aug. 7, cents per pound except as otherwise noted. Code numbers following mill points indicate producing company. Key to producers, page 182; to footnotes, page 184. *Changes shown in italics.*

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$73.50

INGOTS, Alloy (NT)
Detroit S41 .....$77.00
Farrell,Pa. S3 .....77.00
Lowellville,O. S3 .....77.00
Midland,Pa. C18 .....77.00
Munhall,Pa. U5 .....77.00
Sharon,Pa. S3 .....77.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Bridgeport,Conn. N19 ..80.50
Buffalo R2 .....77.50
Clairton,Pa. U5 .....77.50
Ensley,Ala. T2 .....77.50
Fairfield,Ala. T2 .....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 .....77.50
Johnstown,Pa. B2 ....77.50
Lackawanna,N.Y. B2 ..77.50
Munhall,Pa. U5 .....77.50
S.Chicago,Ill. R2, U5 ..77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 .....77.50
Youngstown R2 .....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Bridgeport,Conn. N19..101.00
Buffalo R2 .....96.00
Canton,O. R2 .....98.50
Clairton,Pa. U5 .....96.00
Conshohocken,Pa. A3 101.00
Ensley, Ala. T2 .....96.00
Fairfield,Ala. T2 .....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 .....96.00
Geneva,Utah C11 ....96.00
Houston S5 .....101.00
Johnstown,Pa. B2 .....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....105.50
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
Seattle B3 .....109.50
Sharon,Pa. S3 .....96.00
S.Chicago R2,U5,W14 96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ...105.50
Warren,O. C17 .....96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$114.00
Bridgeport,Conn. N19..114.00
Buffalo R2 .....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3 121.00
Detroit S41 .....114.00
Farrell,Pa. S3 .....114.00
Fontana,Calif. K1 ...135.00
Gary,Ind. U5 .....114.00
Houston S5 .....119.00
Ind.Harbor,Ind. Y1 ...114.00
Johnstown,Pa. B2 ...114.00
Lackawanna,N.Y. B2 114.00
LosAngeles B3 .....134.00
Lowellville,O. S3 ....114.00
Massillon,O. R2 .....114.00
Midland,Pa. C18 .....114.00
Munhall,Pa. U5 .....114.00
Sharon,Pa. S3 .....114.00
S.Chicago R2,U5,W14 114.00
S.Duquesne,Pa. U5 ..114.00
Struthers,O. Y1 .....114.00
Warren,O. C17 .....114.00

ROUNDS, SEAMLESS TUBE (NT)
Bridgeport,Conn. N19..$122.50
Buffalo R2 .....117.50
Canton,O. R2 .....120.00
Cleveland,O. R2 .....117.50
Gary,Ind. U5 .....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ..117.50
Warren,O. C17 .....117.50

SKELP
Aliquippa,Pa. J5 .....5.075
LoneStar,Tex. L6 ....5.025
Munhall,Pa. U5 .....4.875
Warren,O. R2 .....4.875
Youngstown R2, U5 ..4.875

WIRE RODS
AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 .....6.15
Alton,Ill. L1 .....6.35
Buffalo W12 .....5.80
Cleveland A7 .....6.15
Donora,Pa. A7 .....6.15
Fairfield,Ala. T2 .....6.15
Houston S5 .....6.40
IndianaHarbor,Ind. Y1..6.15
Johnstown,Pa. B2 ....6.15
Joliet,Ill. A7 .....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 .....6.25
LosAngeles B3 .....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P17 .....6.15
N.Tonawanda,N.Y. B11..6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 .....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill.(1) N15 ....6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 ....5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 .....5.275
Bessemer,Ala. T2 .....5.275
Bethlehem,Pa. B2 ....5.325
Birmingham C15 .....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 ....6.025
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.375
Ind.Harbor,Ind. I-2 ..5.275
Johnstown,Pa. B2 .....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2 ..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ....5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ....5.50
Portland,Oreg. O4 .....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ....5.975
Weirton,W.Va. W6 ....5.275

Wide Flange
Bethlehem,Pa. B2 ....5.325
Clairton,Pa. U5 .....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2 5.525
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4 ....5.50
S.Chicago,Ill. U5 .....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 .....8.50
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 .....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14..7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 .....6.225

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky. (15) A10 5.10
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymont,Del. C22 ....5.70
Cleveland J5, R2 .....5.20
Coatesville,Pa. L7 .....5.50
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.20
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.85
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 .....5.30
Harrisburg,Pa. P4 .....5.80
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 .....5.45
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale, Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown R2, U5, Y1 5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.35
Fontana,Calif. K1 .....7.50
Geneva, Utah C11 ....6.75
Johnstown,Pa. B2 ....7.00
SparrowsPoint,Md. B2 .7.00

PLATES, Wrought Iron
Economy,Pa. B14 .....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.625
Bessemer,Ala. T2 .....7.625
Clairton,Pa. U5 .....7.625
Claymont,Del. C22 ....7.625
Cleveland J5, R2 ....7.625
Coatesville,Pa. L7 ....7.55
Conshohocken,Pa. A3..7.625
Ecorse,Mich. G5 .....7.725
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1. 8.375
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 ....7.625
Lackawanna,N.Y. B2 ..7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 7.625
SparrowsPoint,Md. B2 7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, Alloy
Aliquippa,Pa. J5 .....7.20
Claymont,Del. C22 .....7.20
Coatesville,Pa. L7 .....7.20
Farrell,Pa. S3 .....7.20
Fontana,Calif.(30) K1..7.95
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall,Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14 7.20
SparrowsPoint,Md. B2 .7.20
Youngstown Y1 .....7.20

FLOOR PLATES
Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Harrisburg,Pa. P4 ....6.275
Ind.Harbor,Ind. I-2 ..6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron
Ashland c.l. (15) A10..5.35
Ashland l.c.l. (15) A10..5.85
Cleveland c.l. R2 .....5.85
Warren,O. c.l. R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.425
Aliquippa,Pa.(9) J5 ....5.425
Alton,Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ..5.425
Bridgeport,Conn.(9) N19 5.65
Buffalo(9) R2 .....5.425
Clairton,Pa.(9) U5 ....5.425
Cleveland(9) R2 .....5.425
Ecorse,Mich.(9) G5 ....5.525
Emeryville,Calif. J7 ...6.175
Fairfield,Ala.(9) T2 ..5.425
Fairless,Pa.(9) U5 .....5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston(9) S5 .....5.675
Ind.Harbor(9) I-2, Y1 5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ....5.875
Niles,Calif. P1 .....6.125
N.T'wanda,N.Y.(46)B11 5.775
Pittsburg,Calif.(9) C11 6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 ....6.175
Seattle B3, N14 .....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 .5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ...5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..5.425
Torrance,Calif.(9) C11 6.125
Youngstown(9) R2, U5 5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.475
Bethlehem,Pa. B2 ....6.475
Bridgeport,Conn. N19 ..6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 .....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Ecorse,Mich. G5 .....6.575
Fairless,Pa. U5 .....6.625
Farrell,Pa. S3 .....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1 6.475
Johnstown,Pa. B2 ....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 .....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 .....6.475
Warren,O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....7.925
Bessemer,Ala. T2 .....7.925
Bethlehem,Pa. B2 .....7.925
Bridgeport,Conn. N19 ..7.95
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....8.025
Fairfield,Ala. T2 .....7.925
Fontana,Calif. K1 .....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 ..7.925
Johnstown,Pa. B2 .....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2 ..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1) N15 ..5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet,Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 .....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ...9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 .....10.10
Chicago W18 .....9.925
Cleveland C20 .....9.925
LosAngeles P2, S30
(Gr. A) 11.30
(Gr. B) 11.80
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 .....10.10
SpringCity,Pa. K3 ....10.10
Warren,O. C17 .....9.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 .....7.90
Bridgeport,Conn. N19 ..7.65
Buffalo B5 .....7.35
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 .....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 ..7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2..7.30
Hartford,Conn. R2 .....7.80
Harvey,Ill. B5 .....7.30
LosAngeles P2, S30 ....8.75
LosAngeles R2 .....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ...7.85
S.Chicago,Ill. W14 .....7.30
SpringCity,Pa. K3 .....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic,Conn. J5 ...7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa. M12,R2 8.775
Bethlehem,Pa. B2 .....8.775
Bridgeport,Conn. N19 ..8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 ...8.775
Gary,Ind. R2 .....8.775
GreenBay,Wis. F7 .....8.775
Hammond,Ind. J5, L2..8.775
Hartford,Conn. R2 .....9.075
Harvey,Ill. B5 .....8.775
Lackawanna,N.Y. B2 ..8.775
Los Angeles P2, S30...10.65
Mansfield,Mass. B5 ....9.075
Massillon,O. R2, R8 ..8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark,N.J. W18 .....8.95
Plymouth,Mich. P5 ...8.975
S.Chicago W14 .....8.775
SpringCity,Pa. K3 .....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 .....8.775
Worcester,Mass. A7 ...9.075
Youngstown F3, Y1 ....8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.425
Atlanta A11 .....5.625
Birmingham C15 .....5.425
Bridgeport,Conn. N19 ...5.65
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emerysville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 ....6.125
Ft. Worth,Tex. (4) (26) T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2,Y1 5.425
Johnstown,Pa. B2 ....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.675
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ..6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 .....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2 ..5.425
Sterling,Ill. (1) N15 ...5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ....6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 .....7.08
KansasCity,Mo. S5 .....7.35
Lackawanna,N.Y. B2 ...6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia B2 .....7.38
Pittsburgh J5, U8 .....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ...7.08
Williamsport,Pa. S19 ...7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy(Staybolt)B14 .18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 .5.325
ChicagoHts.(4)(44) I-2 .5.425
ChicagoHts.(4) C2 ....5.425
Ft.Worth,Tex.(26) T4 ..5.875
Franklin,Pa.(3) F5 ...5.325
Franklin,Pa.(4) F5 ...5.425
JerseyShore,Pa.(4) J8 ..5.10
Marion,O.(3) P11 .....5.325
Tonawanda(3) R12 ....5.325
Tonawanda(4) B12 .....6.00
Williamsport, Pa.(3)S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 ....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 ....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 ....5.775
Gary,Ind. U5 .....4.925
Geneva,Utah C11 ....5.025
GraniteCity,Ill.(8) G4..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ...4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 ....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2..4.925
Steubenville,O. W10 ...4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1..4.925

SHEETS, H.R., (19 Ga.& Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ....8.10

SHEETS, H.R. (14 Ga.& Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 ....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.125
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2,Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna(35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5,W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2..7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ....7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 . 6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ...6.05
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 .....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 .....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 .....8.975
Ecorse,Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ...10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint(38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	.....6.95	7.20
Gary,Ind. U5	.....6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	...6.95	7.20
Irvin,Pa. U5	.....6.95	7.20
Kokomo,Ind. C16	..7.05	...
MartinsFry. W10	.6.95	7.20
Pittsburgh J5	....6.95	...
Pitts.,Calif. C11	.7.70	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ... 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.60‡
Ashland,Ky. A10 ....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 .....6.60†
Gary,Ind. U5 .....6.60•
GraniteCity,Ill. G4 ....6.80•
Ind.Harbor,Ind. I-2 ...6.60†
Irvin,Pa. U5 .....6.60•
Kokomo,Ind. C16 .....6.70‡
MartinsFerry,O. W10 .6.60•
Middletown,O. A10 ..6.60†
Pittsburg,Calif. C11 ..7.35•
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ...6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60•

•Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.275

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ...9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.425
Niles,O.(28) R2 .....7.425
Weirton,W.Va. W6 .....7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) .9.25
Butler,Pa. A10 (type 2) .9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 ....6.625
Cleveland R2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 .....6.825
Ind.Harbor,Ind. I-2,Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 .....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.65
Ind.Harbor,Ind. I-2 ...8.475
Yorkville,O. W10 ....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7 00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.40

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston Division, H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N19 Northeastern Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.

T2 Tenn. Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div., U.S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton,Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	5.125
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo(27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	5.025
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.775
Gary,Ind. U5	4.925
Houston S5	5.175
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa.(25) B2	4.925
KansasCity,Mo. S5	5.175
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Pittsburg,Calif. C11	5.675
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	6.35
Seattle N14	5.675
Sharon,Pa. S3	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill.(1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. S3	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.425
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Houston S5	7.575
Ind.Harbor,Ind. I-2, Y1	7.325
KansasCity,Mo. S5	7.575
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Conshohocken,Pa. A3	7.20
Dearborn,Mich. D3	7.25
Detroit D2, M1, P20	7.25
Dover,O. G6	7.15
Ecorse,Mich. G5	7.25
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor,Ind. Y1	7.15
Indianapolis C8	7.30
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain(10) S15	7.15
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia(45) P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y.(32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J.(31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.25
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.55
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.55
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45
Weirton,W.Va. W6	10.45
Youngstown Y1	10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	....	....
Fostoria,O. S1	10.05	11.15	13.10	16.10	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.65	10.10	12.30	15.30	18.25
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	17.10	....	....
Fostoria,O. S1	18.30	22.15	....
FranklinPark,Ill. T6	17.45	21.30	25.65
Harrison,N.J. C18	18.10	21.95	26.30
NewYork W3	18.10	21.95	26.30
Palmer,Mass. W12	17.10	....	....
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6	18.10	21.95	26.30
Youngstown J5	17.45	21.30	25.65

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP coils)	....	....	11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.50	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10 (FP coils)	..	11.35	12.05	13.15	14.20

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	14.75	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	....
Butler,Pa. A10	....	....	....	19.20	19.70	20.20
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif. K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va. W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.85
Bartonville,Ill. K4	7.75
Buffalo W12	7.20
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	12.65
Buffalo W12	11.90
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.20
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	11.90
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	8.70
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
NewHaven,Conn. A7	9.60
Palmer,Mass. W12	9.00
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,Mass. A7	9.60

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Bartonville,Ill. K4	9.40
Buffalo W12	9.025
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Milbury,Mass.(12) N6	9.325
Minnequa,Colo. C10	9.55
Monessen,Pa. P7, P16	9.30
Muncie,Ind. I-7	9.50
Palmer,Mass. W12	9.325
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester T6, W12	9.325
Worcester,Mass. A7, J4	9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	14.45
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P7	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	14.75
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE

Bartonville,Ill. K4	12.75
Buffalo W12	12.00
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	12.30
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	15.45
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	10.75
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. M8	11.65
Dover,O. G6	11.65
Fostoria,O. S1	11.95
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.05
Pawtucket,R.I. N8	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren,O. B9	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Houston,Tex. S5	178
Fairfield,Ala. T2	173
Jacksonville,Fla.(20) M8	184
Joliet,Ill. A7	173
Johnstown,Pa. B2	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7 ....$8.95

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla.(20) M8	186
Joliet,Ill. A7	175
Johnstown,Pa. B2	175
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	9.82
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.82
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFraicisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.15
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	11.16
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.20
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	11.21
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	10.75

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	219
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
Sterling,Ill.(7) N15	214
SparrowsPt.,Md. B2	214
Williamsport,Pa. S19	175

FENCE POSTS

Birmingham C15	171
ChicagoHts.,Ill. C2, I-2	172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	171
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	174

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston,Tex. S5	198**
Jacksonville,Fla. M8	203
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196*
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213**
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198§

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston,Tex. S5	192**
Jacksonville,Fla. M8	197
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192§

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa. J5	17.15	18.95
Bartonville K4	17.25	19.05
Cleveland A7	17.15	....
Crawf'dsville M8	17.25	19.05
Fostoria,O. S1	17.65	19.20†
Houston S5	17.40	18.95**
Jacksonville M8	17.50	19.30
Johnstown B2	17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	17.25	18.80†
Minnequa C10	17.40	18.95**
P'lm'r,Mass. W12	16.30	17.85†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37) N15	17.25	19.05§
Waukegan A7	17.15	18.70†
Worcester A7	17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	8.65 9.20**
Aliquippa J5	8.65 9.325§
Atlanta (48) A11	8.75 9.425*
Bartonville(48) K4	8.75 9.425
Buffalo W12	8.20 8.75†
Cleveland A7	8.65 ....
Crawfordsville M8	8.75 9.425
Donora,Pa. A7	8.65 9.20†
Duluth A7	8.65 9.20†
Fairfield T2	8.65 9.20†
Houston(48) S5	8.90 9.45**
Jacks'ville,Fla. M8	9.00 9.675
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	8.65 9.20†
Kans.City(48) S5	8.90 9.45**
Kokomo C16	8.75 9.30†
LosAngeles B3	9.60 10.275§
Minnequa C10	8.90 9.45**
Monessen P7(48)	8.65 9.25*
Palmer,Mass. W12	8.50 9.05†
Pitts.,Calif. C11	9.60 10.15†
Rankin,Pa. A7	8.65 9.20†
S.Chicago R2	8.65 9.20**
S.SanFran. C10	9.60 10.15**
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	8.90 9.575§
Sterling(1)(48)	8.80 9.475§
Struth'rs.O.(48)Y1	8.65 9.30†
Worcester,Mass. A7	8.95 9.50†

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:
6 in. and shorter.... 52.5
Longer than 6 in.. 43.5
⅝ in. thru 1 in.:
6 in. and shorter.... 43.5
Longer than 6 in.. 41.5
1⅛ in. and larger:
All lengths 41.5
Undersized Body (rolled thread)
½ in. and smaller:
6 in. and shorter... 52.5

Carriage, Machine, Lag Bolts
Hot Galvanized:
½ in. and smaller:
6 in. and shorter... 32.0
Longer than 6 in.. 19.0
⅝ in. and larger:
All lengths 16.0

Lag Bolts (all diam.)
6 in. and shorter... 52.5
Longer than 6 in.. 44.5

Plow and Tap Bolts
½ in. and smaller by 6 in. and shorter 52.0
Larger than ½ in. or longer than 6 in.. 44.5

Blank Bolts 44.5

Step, Elevator, Tire Bolts 52.0

Stove Bolts, Slotted:
⅛ to ¼-in. incl., 3 in. and shorter.. 54.00
⅛ to ½ in., inclusive 54.00

NUTS

Reg. & Heavy Square Nuts:
All sizes 58.0

Square Nuts, Reg. &
Heavy, Hot Galvanized:
All sizes 44.0

Hex Nuts, Reg. &
Heavy, Hot Pressed:
¾ in. and smaller.. 61.5
⅞ in. to 1 in., incl. 57.5
1⅛ in. to 1½ in., incl. 62.5
1⅝ in. and larger.. 56.0

Hex Nuts, Reg. &
Heavy, Cold Punched:
¾ in. and smaller.. 61.5
⅞ in. to 1⅛ in., incl. 57.5
1⅝ in. and larger.. 56.0

Hex Nuts, All Types,
Hot Galvanized:
¾ in. and smaller.. 48.0
⅞ in. to 1 in., incl.. 44.0
1⅛ in. to 1½ in., incl. 49.0

Hex Nuts, Semifinished, Heavy (Incl. Slotted):
¾ in. and smaller.. 61.5
⅞ in. to 1½ in., incl. 57.5
1⅝ in. and larger.. 56.0

Hex Nuts, Finished (Incl. Slotted and Castillated):
1 in. and smaller.... 64.0
1⅛ in. to 1½ in., incl. 60.5
1⅝ in. and larger .. 56.0

Semifinished Hex Nuts, Reg. (Incl. Slotted):
⅝ in. and smaller.. 61.5
¾ in. to 1 in., incl. 64.0
1⅛ in. to 1½ in., incl. 60.5
1⅝ in. and larger .. 56.0

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:
6 in. and shorter:
⅝ in. and smaller.. 44.0
¾, ⅞ and 1 in. diam. 27.0
Longer than 6 in.:
⅝ in. and smaller.. 14.0
¾, ⅞ and 1 in. diam. 0.5

High Carbon, Heat Treated:
6 in. and shorter:
⅝ in. and smaller.. 31.0
¾, ⅞ and 1 in. diam. 9.0
Longer than 6 in.:
⅝ in. and smaller.. +6
¾, ⅞ and 1 in. diam. .....+24

Flat Head Capscrews:
¾ in. and smaller..+65.0

Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam.:
6 in. and shorter... 11
Longer than 6 in...+10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.25
7/16 in. under list less 19%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2¼	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All 60 lb	Tee Rails Under
RAILS				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Huntington,W.Va. C15	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	....(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
Ind.Harbor,Ind. I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS

Bessemer,Pa. U5	6.975
Fairfield,Ala. T2	6.975
Ind.Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES

Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated

Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES

Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 6.045c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.50c.
(31) Widths over ⅝-in.; 7.60c, for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, over 0.022", 8.20c.
(46) Special quality.
(48) 6-7 Ga.
(49) 3½-in. and smaller rounds; 8.65c, over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.5	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	....	45.75	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.50	47.75	50.75	55.50	55.50
304L	....	....	48.25	51.50	53.25	55.50	58.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.50	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	....	....	86.50	....	92.75	....	104.50
316	39.75	49.50	62.25	69.25	69.50	73.00	76.75	81.50	81.50
316L	....	....	70.00	76.50	77.25	80.75	84.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	118.75	....	132.00	138.50	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	36.00	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.75	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.25	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.75	34.25	36.25	48.25	48.25
420	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.75	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.25	34.75	36.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Jones & Laughlin Steel Corp.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.00	39.85

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.43-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.170
18.25	4.25	1	4.75	...	2.385
18	4	2	9	...	2.755
18	4	2	....	...	1.845
18	4	1	....	...	1.680
9	3.5	..	....	...	1.275
13.5	4	3	....	...	1.945
13.75	3.75	2	5	...	2.325
6.4	4.5	1.9	....	5	1.185
6	4	3	....	6	1.430
1.5	4	1	....	8.5	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	62.00	62.50	....	....
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	....
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.46	68.96	68.96	69.46
Muskegon,Mich., deld.	....	80.33	80.33	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,O., deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
New York, deld.	....	74.70	75.20	....
Newark,N.J., deld.	72.02	72.52	73.02	73.52
Philadelphia, deld.	69.88	70.38	70.88	71.38
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland, Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard, O. Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,O., deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett, Mass. E1	66.50	67.00	67.50	....
Fontana,Calif. K1	74.00	74.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,O. I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	77.25
Buffalo H1	78.50

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	81.76
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.59§	9.86§	10.13§	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.76	....	8.76	9.06	9.13§	15.18	9.19	8.66	10.14
Birmingham	7.80	9.00	9.52	....	7.82	8.07	10.12	....	8.20	8.16	10.31
Boston	9.31	10.40	11.41	....	9.35	9.68	....	15.24	9.59	9.65	11.13
Buffalo	8.25	9.45	11.07	....	8.50	8.86	....	15.00	8.90	8.90	10.45
Chattanooga	7.99	9.24	9.10	....	8.00	8.24	10.04	....	8.44	8.40	10.26
Chicago	8.20	9.45	10.00	....	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	....	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	....	8.33	8.69	....	14.74	9.01	8.79	10.11
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	....	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95§§	....	8.50	8.75	9.05§§	....	9.00	8.85	10.10
Houston	8.45	9.75	8.45	....	8.60	9.05	11.10	....	9.10	9.05	10.30
Jackson, Miss.	8.09	9.34	9.79	....	8.16	8.41	10.23	....	8.54	8.50	10.34
Los Angeles	9.50	10.75	11.65	....	9.55	9.70	12.75	16.00	9.60	9.55	11.70
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	....	9.31	9.57	....	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	10.24	51.94	8.67	8.65	9.76	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	50.00	8.33	8.60	....	14.65	8.64	8.56	9.88
Portland, Oreg.	9.50	11.20	11.55	57.20	11.35‡‡	9.65	14.50	15.95	9.65	9.30	12.50
Richmond, Va.	8.00	....	10.14	....	8.55	8.40	10.00	....	8.95	8.40	9.90
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.61	....	8.84	9.22	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	54.85	9.45	9.70	13.00	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.20	10.00	10.10	14.05	16.35	9.80	9.70	12.10
Spokane, Wash.	9.95	11.15	12.00	....	10.00	10.10	14.05	17.10	9.80	9.70	12.10
Washington	8.48	9.58	....	....	9.06	9.15	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras, except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; §42 in. and under; **⅛-in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; §—400 to 9999 lb; §—1000 to 1999 lb; §—2000 to 3999 lb; §§—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, O., $138; Cutler, Utah, $165.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $150; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $96.75; Clearfield, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Narlo, O., $16; Thornton, McCook, Ill., $16.35; Gibsonburg, O., $16.75; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½-in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜-in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36-40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry duty paid, metallurgical grade: European, $33-34; Mexican, all-rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi river, ocean bags 23,000 lb and over..	10.50
F.o.b. Riverton or Camden, N. J., west of Mississippi river.	9.50
Sponge Iron, domestic, 98 + % Fe.: Deld. east of Mississippi river, 23,000 lb and over	10.50
F.o.b. Riverton, N.J., west of Mississippi river	9.50
Sponge Iron, Canadian: F.o.b. shipping point	9.50
Electrolytic Iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99+ % Fe)	36.00
Unannealed (99+ % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	

Aluminum: Atomized, 500 lb drum, fr'ght allowed	
Carlots	38.20
Ton lots	40.20
Antimony, 500 lb lots.	32.00*
Brass, 5000-lb lots	*32.40-40.40†*
Bronze, 5000-lb lots	50.20-54.70†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.15
Nickel-Silver, 5000-lb lots	*50.70-55.30†*
Phosphor-Copper, 5000-lb lots	62.00
Copper (atomized) 5000-lb lots	*42.50-51.00‡*
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.08
Stainless Steel, 316	$1.44
Tin	14.50*
Zinc, 5000-lb lots	*17.50-30.70‡*
Tungsten: Melting grade, 99% 60 to 2000 mesh:	Dollars
1000 lb and over	3.75
Less than 1000 lb	3.90
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam.	Inches Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5½	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	15.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$6.58	$6.53	$6.53	$6.76
Bar Size Angles	6.62	6.57	6.57	6.75
Structural Angles	6.62	6.57	6.57	6.75
I-Beams	6.87	6.82	6.82	7.00
Channels	6.87	6.82	6.82	7.00
Plates (basic bessemer)	8.50	8.45	8.45	8.75
Sheets, H.R.	8.50	8.45	8.45	8.75
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.79	26.67	26.67	27.36
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.87	6.82	6.82	7.22
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (§)	8.38	8.38	8.38	8.58

†Per 82-lb. net, reel. §Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old range bessemer	11.85
Old range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	32.00-33.00

Tungsten Ore

Net ton unit, before duty

Foreign wolframite, good commercial quality	20.00-23.00
Domestic, concentrates mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U. S. ports, duty for buyer's account: other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$55.00-58.00
48% 2.8:1	52.00-55.00
48% no ratio	46.00-48.00
South African Transvaal	
48% no ratio	$40.00-41.00
44% no ratio	30.00-31.00
Turkish	
48% 3:1	$59.00-62.00
Domestic Rail nearest seller	
18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	*$2.90-3.30*
60-65%	*3.30-3.60*

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.75-15.75
Connellsville, foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, deld.	32.25
Saginaw, deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.24
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.80 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $255, Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb of contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lots 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk, 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ¼" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13c per lb of contained Si. Packed c.l. 15.5c, ton lot 16.95c, less ton 18.6c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 20.00c per lb of Si. Packed, c.l. 21.65c, ton lot 22.95c, less ton 23.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3½ lb each and containing 2 lb of Cr). Contract, carload, bulk 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17 Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

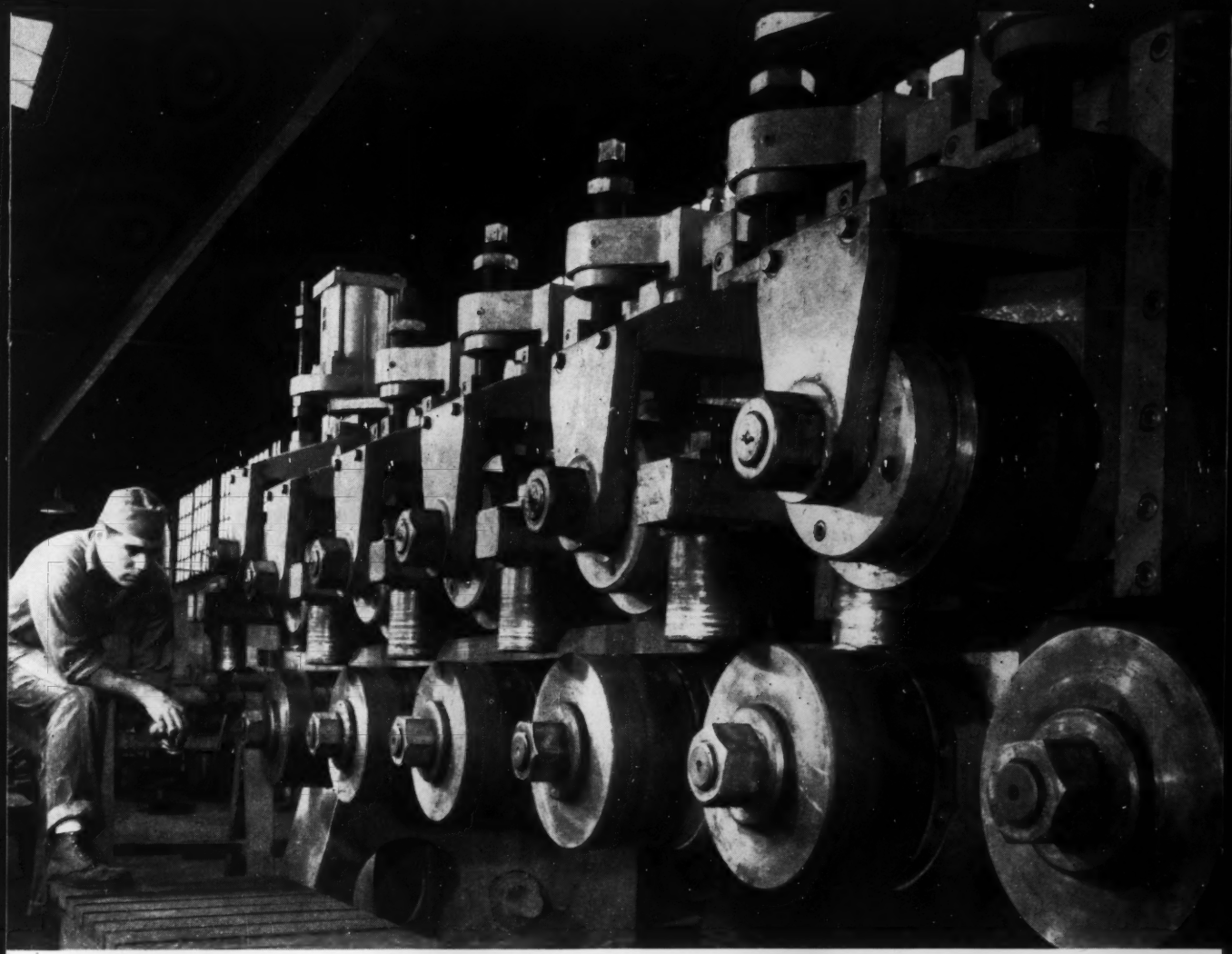
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.



Blaw-Knox Medart straightener installed at Jessop Steel Company's Bar Mill at Washington, Pennsylvania.

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Scrap Price Rise Is Short-Lived

Recent upturn gives way to down-pressure attending sluggish domestic demand. STEEL's composite on the prime grade slips 67 cents to $53.83

Scrap Prices, Page 192

Philadelphia—Primary grades of heavy melting steel scrap are off $1 a ton, but other grades are unchanged, or nominal, due to the absence of new buying, notably of borings and turnings. Heavy turnings are $1 lower. Tonnage is moving to docks for export in good volume with prices averaging $2 a ton over brokers' domestic quotations.

New York—Export volume is supporting steel scrap prices during the dull period in domestic shipments. Loading at docks is active at prices $2 to $3 a ton higher than on domestic tonnage. For the latter, brokers pay $50-$51, shipping point, for No. 1 heavy melting. No. 2 bundles are slightly easier. The cast iron grades are unchanged but the market is firm.

Boston—Prices paid by brokers for heavy melting steel, dock delivery for export, are substantially higher than those paid for domestic shipment. No. 1 heavy melting is quoted $51. This is broadening the area from this port from which scrap is drawn to fill export orders.

Steel mill buying is light. The Worcester consumer posts $48, brokers' buying price, for August, but the price is largely nominal; also $36 for No. 2 heavy melting, and $34 for No. 2 bundles. The latter grades are more in line with what is paid for dock delivery.

Chicago—Speculative buying of scrap by brokers on the strength of a substantial pickup in steelmaking operations in the last four months this year, and light buying by consumers, are counter influences which are serving to hold prices reasonably stable. But the market actually is strong with the mills having only limited quantities offered at the prices they are willing to pay. An example is No. 2 bundles which last week were sold to a local mill for $40 a ton, or $2 below the price which had been prevailing. Today, consumers are able to acquire only token tonnages of this grade for $42. The prices which railroads are getting for their offerings—several dollars above prices the mills have been paying for corresponding grades—constitute another bullish factor.

Detroit—A wildcat strike at the plant of Great Lakes Steel Corp. threw the scrap market into something of a dither last week when incoming shipments on old orders were embargoed pending settlement of the walkout. This followed a small purchase of No. 1 steel at $55 delivered. As a result of this sale brokers' buying prices are up about $1 to $51-$52, though this price is largely nominal in the absence of active demand and uncer-

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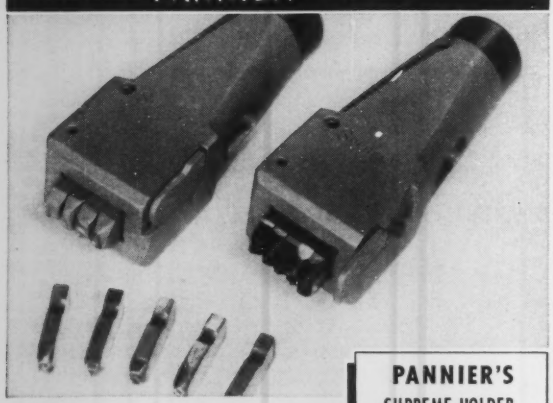

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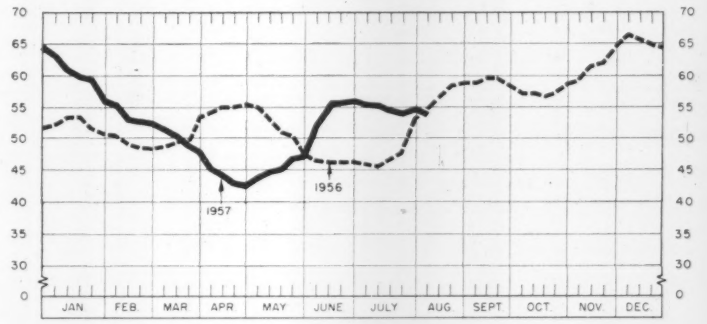
STEELMAKING SCRAP PRICE COMPOSITE

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania—Compiled by STEEL



Aug. 7 1957	Week Ago	Month Ago	Year Ago	July Avg.
$54.83	$54.50	$55.17	$54.83	$54.67

tainty with respect to steel operations over the next week or so. Automotive tonnage at the end of this month is expected to be off. This may be a factor for strength when bidding starts.

Pittsburgh—A mill bought No. 1 heavy melting for $56, Pittsburgh, last week. It paid $49 for No. 2 heavy melting and $45 for No. 2 bundles. While the first two prices represented declines of $1, No. 2 bundles were $3 lower than in previous sales.

Although this was the only activity of the week, the buy was not considered a trend toward lower scrap prices.

Cleveland—The market continues in the doldrums. Mill inventories are adequate to support current operations and they are showing little interest in additional accumulations. The tone of the market is firm, largely reflecting optimistic sentiment stemming from expectations of a late summer pickup in demand. The flow of material to the market is not so heavy as it was because of slackened manufacturing operations.

Youngstown—Scrap is showing signs of strengthening, largely reflecting strength at other consuming centers rather than volume buying. The last sale of No. 1 heavy melting here was at $56.

Buffalo — Dealers are awaiting placement of new orders by the leading local mill. The market undertone is firm, having taken notice of the Aug. 1 jump of $5 a ton in prices at Hamilton, Ont. The trade thinks No. 1 heavy melting will go up about $2 a ton when new orders are placed, but there is considerable uncertainty as to how the No. 2 grades will fare. Two local mills are not buying at present.

Cincinnati—A local mill entered the market last week with a good tonnage buy, confirming the price move-up of the week preceding. No. 1 heavy melting is now quoted $52-$53, No. 2 heavy melting $42-$43. The buying support is expected to stabilize the market for the remainder of this month.

Birmingham — Although some brokers say scrap is beginning to come into the yards in better volume, supplies appear tight. Prices on certain electric furnace and railroad grades were advanced last week. There is no demand for the open-hearth grades. The cast iron market is firm despite refusal of some consumers to pay present prices. In a nearby market, the price on No. 1 cupola cast was cut 50 cents a ton. The export market is dull, but dealers are still able to sell material at coastal points at prices above those offered by domestic consumers.

St. Louis—The scrap market is strong with buying somewhat more active. Supplies are tight, and much of the metal available is going to outside districts. Local consumers are resisting the resulting upward pressure on prices. Mill receipts are below daily melt.

(*Please turn to page* 197)

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Aug. 7, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Aug. 7	$54.83
July 31	54.50
July Avg.	54.67
Aug. 1956	57.13
Aug. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*55.00-56.00*
No. 2 heavy melting	*48.00-49.00*
No. 1 factory bundles	*63.00-64.00*
No. 1 dealer bundles	*55.00-56.00*
No. 2 bundles	*44.00-45.00*
No. 1 busheling	*55.00-56.00*
Machine shop turnings	33.00-34.00
Mixed borings, turnings	33.00-34.00
Short shovel turnings	37.00-38.00
Cast iron borings	37.00-38.00
Cut Structurals:	
2 ft and under	*63.00-64.00*
3 ft lengths	*62.00-63.00*
Heavy turnings	50.00-51.00
Punchings & plate scrap	*62.00-63.00*
Electric furnace bundles	*62.00-63.00*

Cast Iron Grades

No. 1 cupola	49.00-50.00
Heavy breakable cast	47.00-48.00
Unstripped motor blocks	36.00-37.00
No. 1 machinery cast	59.00-60.00

Railroad Scrap

No. 1 R.R. heavy melt.	64.00-65.00
Rails, 2 ft and under	75.00-76.00
Rails, 18 in. and under	76.00-77.00
Rails, random lengths	73.00-74.00
Railroad specialties	73.00-74.00

Stainless Steel Scrap

18-8 bundles & solids	300.00-315.00
18-8 turnings	190.00-215.00
430 bundles & solids	80.00-85.00
430 turnings	55.00-60.00

CLEVELAND

No. 1 heavy melting	52.00-53.00
No. 2 heavy melting	*44.00-45.00*
No. 1 factory bundles	57.00-58.00
No. 1 bundles	52.00-53.00
No. 2 bundles	*40.00-41.00*
No. 1 busheling	52.00-53.00
Machine shop turnings	23.00-24.00
Short shovel turnings	27.00-28.00
Mixed borings, turnings	27.00-28.00
Cast iron borings	27.00-28.00
Cut foundry steel	55.00-56.00
Cut structurals, plates 2 ft and under	63.00-64.00
Low phos. punchings & plate	*53.00-54.00*
Alloy free, short shovel turnings	30.00-31.00
Electric furnace bundles	*53.00-54.00*

Cast Iron Grades

No. 1 cupola	53.00-54.00
Charging box cast	43.00-44.00
Heavy breakable cast	41.00-42.00
Stove plate	50.00-51.00
Unstripped motor blocks	37.00-38.00
Brake shoes	41.00-42.00
Clean auto cast	54.00-55.00
Burnt cast	39.00-40.00
Drop broken machinery	56.00-57.00

Railroad Scrap

No. 1 R.R. heavy melt.	57.00-58.00
R.R. malleable	61.00-62.00
Rails, 2 ft and under	75.00-76.00
Rails, 18 in. and under	76.00-77.00
Rails, random lengths	68.00-69.00
Cast steel	63.00-64.00
Railroad specialties	65.00-66.00
Uncut tires	63.00-64.00
Angles, splice bars	67.00-68.00
Rails, rerolling	73.00-74.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	300.00-305.00
18-8 turnings	200.00-205.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	55.00-56.00
No. 2 heavy melting	48.00-49.00
No. 1 bundles	55.00-56.00
No. 2 bundles	45.00-46.00
No. 1 busheling	55.00-56.00
Machine shop turnings	23.00-24.00
Short shovel turnings	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	*58.00-59.00*
Electric furnace bundles	*58.00-59.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*62.00-63.00*

CHICAGO

No. 1 heavy melt., indus.	55.00-56.00
No. 1 hvy melt., dealer	52.00-53.00
No. 2 heavy melting	46.00-47.00
No. 1 factory bundles	59.00-60.00
No. 1 dealer bundles	53.00-54.00
No. 2 bundles	*41.00-42.00*
No. 1 busheling, indus.	55.00-56.00
No. 1 busheling, dealer	52.00-53.00
Machine shop turnings	*35.00-36.00*
Mixed borings, turnings	*37.00-38.00*
Short shovel turnings	*37.00-38.00*
Cast iron borings	*37.00-38.00*
Cut structurals, 3 ft	58.00-59.00
Punchings & plate scrap	59.00-60.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Stove plate	45.00-46.00
Unstripped motor blocks	35.00-36.00
Clean auto cast	53.00-54.00
Drop broken machinery	53.00-54.00

Railroad Scrap

No. 1 R.R. heavy melt.	59.00-60.00
R.R. malleable	62.00-63.00
Rails, 2 ft and under	79.00-80.00
Rails, 18 in. and under	80.00-81.00
Angles, splice bars	69.00-70.00
Rails, rerolling	79.00-80.00

Stainless Steel Scrap

18-8 bundles & solids	315.00-325.00
18-8 turnings	215.00-225.00
430 bundles & solids	*95.00-100.00*
430 turnings	*65.00-70.00*

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	*51.00-52.00*
No. 2 heavy melting	*43.00*
No. 1 bundles	*51.00-52.00*
No. 2 bundles	*38.00-39.00*
No. 1 busheling	*51.00-52.00*
Machine shop turnings	27.00-28.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	29.00-30.00
Punchings & plate scrap	*62.00-63.00*

Cast Iron Grades

No. 1 cupola	51.00
Charging box cast	*43.00*
Stove plate	44.00
Heavy breakable	*41.00*
Unstripped motor blocks	*29.00-30.00*
Clean auto cast	52.00
Malleable	*53.00†*

†Nominal

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*49.50*
No. 2 heavy melting	*47.00*
No. 1 bundles	*49.50*
No. 2 bundles	*42.00*
No. 1 busheling	*49.50*
Machine shop turnings	30.00
Short shovel turnings	32.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	42.00
Heavy breakable cast	42.00
Unstripped motor blocks	*44.00*
Brake shoes	40.00
Clean auto cast	48.00
Stove plate	*44.00*

Railroad Scrap

No. 1 R.R. heavy melt.	57.00
Rails, 18 in. and under	*77.00*
Rails, random lengths	*70.00*
Rails, rerolling	78.00
Angles, splice bars	63.00

PHILADELPHIA

No. 1 heavy melting	*52.00*
No. 2 heavy melting	*46.00*
No. 1 bundles	*53.00*
No. 2 bundles	*43.50*
No. 1 busheling	*53.00*
Electric furnace bundles	56.00-57.00
Mixed borings, turnings	37.00
Short shovel turnings	38.00-39.00
Machine shop turnings	35.00-36.00
Heavy turnings	*48.00*
Structurals & plate	58.00-59.00
Couplers, springs, wheels	66.00
Rail crops, 2 ft & under	69.00-71.00

Cast Iron Grades

No. 1 cupola	47.00
Heavy breakable cast	53.00
Malleable	62.00†
Drop broken machinery	57.00

†Nominal

NEW YORK

(Brokers' buying prices)

No. 2 heavy melting	*50.00-51.00*
No. 2 heavy melting	41.00-42.00
No. 1 bundles	*50.00-51.00*
No. 2 bundles	*39.00-39.50*
Machine shop turnings	26.00-27.00
Mixed borings, turning	27.00-28.00
Short shovel turnings	29.00-30.00
Low phos. (structural & plate	53.00-54.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Unstripped motor blocks	39.00-40.00
Heavy breakable	46.00-47.00

Stainless Steel

18-8 sheets, clips, solids	280.00-285.00
18-8 borings, turnings	170.00-180.00
430 sheets, clips, solids	60.00-70.00
410 sheets, clips, solids	50.00-55.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*41.00-42.00*
No. 2 heavy melting	*34.00-35.00*
No. 1 bundles	*41.00-42.00*
No. 2 bundles	33.00-34.00
No. 1 busheling	*41.00-42.00*
Machine shop turnings	24.00-25.00
Mixed borings, turnings	27.00-28.00
Short shovel turnings	28.00-29.00
No. 1 cast	34.00-35.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	42.00-43.00

BUFFALO

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	46.00-47.00
No. 2 bundles	36.00-37.00
No. 1 busheling	46.00-47.00
Mixed borings, turnings	35.00-36.00
Machine shop turnings	31.00-32.00
Short shovel turnings	36.00-37.00
Cast iron borings	35.00-36.00
Low phos.	53.00-54.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	47.00-48.00
No. 1 machinery	52.00-53.00

Railroad Scrap

Rails, random lengths	61.00-62.00
Rails, 3 ft and under	66.00-67.00
Railroad specialties	59.00-60.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	52.00-53.00
No. 2 heavy melting	*46.00-47.00*
No. 1 bundles	52.00-53.00
No. 2 bundles	*42.00-43.00*
No. 1 busheling	52.00-53.00
Machine shop turnings	33.00-34.00
Mixed borings, turnings	30.00-31.00
Short shovel turnings	36.00-37.00
Cast iron borings	30.00-31.00
Low phos. 18 in.	59.00-60.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast	42.00-43.00
Charging box cast	42.00-43.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	56.00-57.00
Rails, 18 in. and under	71.00-72.00
Rails, random lengths	64.00-65.00

BIRMINGHAM

No. 1 heavy melting	49.00-50.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	49.00-50.00
No. 2 bundles	37.00-38.00
No. 1 busheling	49.00-50.00
Cast iron borings	28.00-29.00
Short shovel turnings	*40.00-41.00*
Machine shop turnings	*39.00-40.00*
Bar crops and plates	55.00-56.00
Structurals & plate	55.00-56.00
Electric furnace bundles	51.00-52.00
Electric furnace:	
3 ft and under	*49.00-50.00*
2 ft and under	*50.00-51.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	54.00-55.00
Stove plate	54.00-55.00
Unstripped motor blocks	44.00-45.00
Charging box cast	37.00-38.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	55.00-56.00
Rails, 18 in. and under	*69.00-70.00*
Rails, rerolling	*77.00-78.00*
Rails, random lengths	*63.00-64.00*
Angles, splice bars	60.00-61.00

SEATTLE

No. 1 heavy melting	*46.00*
No. 2 heavy melting	44.00
No. 1 bundles	44.00
No. 2 bundles	*31.00*
Machine shop turnings	29.00
Mixed borings, turnings	29.00
Electric furnace No. 1	*50.00*

Cast Iron Grades

No. 1 cupola	*40.00*
Heavy breakable cast	37.00
Unstripped motor blocks	32.50
Stove plate (f.o.b. plant)	30.00

LOS ANGELES

No. 1 heavy melting	46.00
No. 2 heavy melting	43.00
No. 1 bundles	45.00
No. 2 bundles	38.00
Machine shop turnings	32.00
Shoveling turnings	34.00
Cast iron borings	32.00
Cut structural and plate, 1 ft and under	61.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	53.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00

SAN FRANCISCO

No. 1 heavy melting	48.00
No. 2 heavy melting	*45.00*
No. 1 bundles	47.00
No. 2 bundles	35.00
Machine shop turnings	32.00
Mixed borings, turnings	32.00
Cast iron borings	32.00
Heavy turnings	32.00
Short shovel turnings	34.00
Cut structurals, 3 ft	56.00

Cast Iron Grades

No. 1 cupola	53.00
Charging box cast	45.00-47.00
Stove plate	46.00
Heavy breakable cast	40.00
Unstripped motor blocks	48.00
Clean auto cast	55.00
No. 1 wheels	48.00
Drop broken machinery	53.00

HAMILTON, ONT.

No. 1 heavy melting	*50.00*
No. 2 heavy melting	*45.00*
No. 1 bundles	*50.00*
No. 2 bundles	*39.00*
Mixed steel scrap	*47.00*
Mixed borings, turnings	*24.00*
Busheling, new factory:	
Prepared	*50.00*
Unprepared	*44.00*
Short steel turnings	30.00
Rails, rerolling	*61.00*

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.

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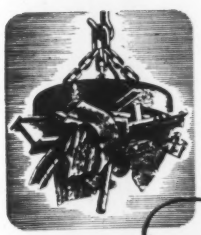

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Lead, Zinc Sales Improve

Most producers report a mild upturn in demand. Some see stable prices ahead, and a few predict fourth quarter increases. Tariff legislation is unlikely

Nonferrous Metal Prices, Pages 196 & 197

LEAD AND ZINC sales have improved somewhat recently, bringing hope that demand for these metals may be on the rise. Lead, especially, has strengthened—but not as much as some published reports indicate.

All companies aren't enjoying the mild sales upswing; several say orders are no better than before. Others admit they are selling better than average tonnages.

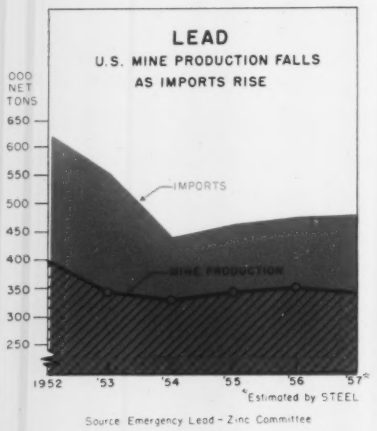
Whether or not the slight sales pickup augurs better things for lead and zinc is a question the producers themselves can't answer. Their hopes for better fall business depend heavily on an across-the-board fourth quarter pickup.

There's a strong feeling among producers that prices of lead and zinc may not go lower; some believe prices might even rise in the fourth quarter. A more pessimistic view is taken by one metals man who says that unless a tariff is imposed prices may tumble another 0.5 to 1 cent a pound.

Buyers aren't too sure about the price line's holding for these reasons: 1. Congress probably won't pass any legislation this session to protect domestic lead and zinc producers from foreign imports (see Page 80). 2. Restrictions made the barter program (U. S. surplus wheat for foreign origin lead and zinc) almost unworkable as a method of absorbing foreign production. 3. Britain's decision to begin the sale next month of about 27,000 tons of zinc from its strategic stockpile will add more metal to an already glutted world market. Another factor that will influence the domestic price is how well foreign prices hold.

Cutbacks Continue—Latest announcement came from Eagle-Picher Co., which temporarily suspended its lead and zinc mining and milling operations in Oklahoma, Missouri and Kansas.

Some metals men think the wave of domestic cutbacks has about ended. Further curtailments, they believe, must come from foreign producers (see chart). Certainly, relief in some form must be given the domestic industry if it is to regain its vitality.



Source: Emergency Lead-Zinc Committee

Magnesium: Price Rise?

There's still no official word on whether or not magnesium prices will go up, but a price bump at this time would be no great surprise. Reason: Magnesium usually follows aluminum's price cycle, since the metals have similar labor contracts.

General Services Administration announced that the government's Painesville, Ohio, electrolytic magnesium smelter will be auctioned off. GSA previously had rejected two bids for the $14.7 million facility.

Primary magnesium production hit 41,267 tons in the first half of 1957 compared with 37,131 tons during the same period last year.

Copper: Down to 28.50

Primary copper now sells for 28.50 cents a pound on the U. S. market. The price was slashed 0.75 cent from the 29.25 cent level on Aug. 6 by Phelps-Dodge Corp., followed the same day by Kennecott Copper Corp. Other producers were expected to match this price.

A price reduction of 2.75 cents occurred in mid-June. A year ago, copper was 40 cents.

The same bugaboo—too much supply, too little demand—is behind the latest fall. Another factor: Weakness in the price of foreign copper.

Market Memo

• By the end of 1958, the U. S. expects to almost double its production of uranium oxide. Production of uranium oxide concentrates during the first half of 1957 was 4200 tons, an increase of 1600 tons over last year's first half production.

NONFERROUS PRICE RECORD

	Price Aug. 7	Last Change	Previous Price	July Avg	June Avg	Aug., 1956 Avg
Aluminum ..	28.10	Aug. 1, 1957	27.10	27.100	27.100	26.700
Copper	28.25–28.50	Aug. 6, 1957	28.25–29.25	28.822	30.250	39.750
Lead	13.80	June 11, 1957	14.80	13.800	14.120	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	34.694
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	94.875	Aug. 7, 1957	95.375	96.576	98.080	99.043
Zinc	10.00	July 1, 1957	10.50	10.000	10.840	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 26.00; ingots, 28.10, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100-lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $120 per lb, nom.

Copper: Electrolytic, 28.50 deld.; custom smelters, 28.25; lake, 29.25 deld.; fire refined, 28.25 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-110 nom. per troy oz.

Lead: Common, 13.80; chemical, 13.90; corroding, 13.90, St. Louis, New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 13 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91B (die casting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $252-255 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $80-100 per troy oz, nom.

Palladium: $21-21.50 per troy oz.

Platinum: $84-87 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $120-125 per troy oz.

Ruthenium: $50-55 per troy oz.

Selenium: $10.50 per lb, commercial grade.

Silver: Open market, 91.125 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55. per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot, 94.875; prompt, 94.75.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.75 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.50.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Die casting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.75-25.50; No. 12 foundry alloy (No. 2 grade), 22.75-23.25; 5% silicon alloy, 0.60 Cu max., 26.00-26.50; 13 alloy, 0.60 Cu max., 26.00-26.50; 195 alloy, 25.75-26.75; 108 alloy, 23.25-23.75. Steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 24.50; grade 2, 22.75; grade 3, 21.75; grade 4, 20.75.

Brass Ingot: Red brass, No. 115, 29.50; tin bronze, No. 225, 39.00; No. 245, 33.50; high-leaded tin bronze, No. 305, 33.50; No. 1 yellow, No. 405, 24.00; manganese bronze, No. 421, 27.00.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.77, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 34.605; l.c.l., 35.23. Weatherproof, 30,000-lb lots, 35.72; l.c.l., 36.47. Magnet wire deld., 15,000 lb or more, 41.93; l.c.l., 42.68.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $19.50 per cwt; pipe, full coils, $19.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.00-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.138	40.90-45.40	....
0.135-0.096	41.40-46.50	37.70-39.60
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	38.60-42.90
0.037-0.030	44.30-50.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.50-53.30	42.60
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.30
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	40.75
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	45.40	51.20
6061-T6	46.90	53.00
2024-T4*	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	—Round— 2011-T3	2017-T4	—Hexagonal— 2011-T3	2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.11	65.50
0.750-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
Rolled				
1.125-1.500	58.60	57.40	62.80	59.60
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	....
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, 45.20-58.60 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 50.50-66.20 in random lengths, 0.375-4 in. thick, width 0.0750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-57.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Thread plate, .188 in., 71.70; .250-2.00 in., 70.60. Tooling plates, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.00-13.50; old sheets, 10.00-10.50; borings and turnings, 6.50

BRASS MILL PRICES

MILL PRODUCTS a — SCRAP ALLOWANCES f

	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	51.38b	48.61c	....	51.57	25.250	25.250	24.500
Yellow Brass	44.69	32.87d	45.23	47.60	19.125	18.875	17.375
Low Brass, 80%	47.40	47.34	47.94	50.21	21.375	21.125	20.625
Red Brass, 85%	48.36	48.30	48.90	51.17	22.250	22.000	21.500
Com. Bronze, 90%	49.86	49.80	50.40	52.42	23.125	22.875	22.375
Manganese Bronze	52.52	46.69	57.19	....	17.625	17.375	16.875
Muntz Metal	46.94	42.75	....	....	17.875	17.625	17.125
Naval Brass	48.85	43.16	55.91	52.26	17.625	17.375	16.875
Silicon Bronze	55.96	55.15	56.00	57.97e	24.750	24.500	24.750
Nickel Silver, 10%	61.52	63.85g	63.85	....	25.750	25.000	12.875
Phos. Bronze, A-5%	70.47	70.97	70.97	72.15	26.250	26.000	25.000

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

7.00; crankcases, 10.00-10.50; industrial castings, 10.00-10.50.

Copper and Brass: No. 1 heavy copper and wire, 21.00-21.50; No. 2 heavy copper and wire, 19.50-20.00; light copper, 17.00-17.50; No. 1 composition red brass, 18.50-19.00; No. 1 composition turnings, 18.00-18.50; yellow brass turnings, 10.75-11.25; new brass clippings, 17.00-17.50; light brass, 10.50-11.00; heavy yellow brass, 12.50-13.00; new brass rod ends, 14.50-15.00; auto radiators, unsweated, 13.50-14.00; cocks and faucets, 14.50-15.00; brass pipe, 15.50-16.00.

Lead: Heavy 9.50-10.00; battery plates, 4.25-4.50; linotype and stereotype, 11.50-12.00; electrotype, 10.00-10.50; mixed babbitt, 11.00-11.50.

Monel: Clippings, 45.00-53.00; old sheets, 44.00-53.00; turnings, 35.00-43.00; rods, 45.00-53.00.

Nickel: Sheets and clips, 85.00-90.00; rolled anodes, 85.00-90.00; turnings, 70.00-75.00; rod ends, 85.00-90.00.

Zinc: Old Zinc, 3.00-3.25; new die-cast scrap, 2.50-3.50; old die-cast scrap, 1.75-2.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 18.00-18.75; 3003 clippings, 18.00-18.75; 6151 clippings, 17.50-18.75; 5052 clippings, 17.50-18.25; 2014 clippings, 17.00-18.25; 2017 clippings, 17.00-18.25; 2024 clippings, 17.00-18.25; mixed clippings, 16.50-17.25; old sheets, 14.50-15.25; old cast, 14.50-15.25; clean old cable (free of steel), 17.50-17.75; borings and turnings, 15.00-16.75.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire 24.50; No. 2 heavy copper and wire, 22.50; light copper, 20.25; refinery brass (60% copper) per dry copper content, 22.125.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 24.50; No. 2 heavy copper and wire, 22.50; light copper, 20.25; No. 1 composition borings, 20.50; No. 1 composition solids, 21.00; heavy yellow brass solids, 15.00; yellow brass turnings, 14.00; radiators, 16.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 46.79; oval, 45.00, 5000-10,000 lb; electrodeposited, 39.50, 2000-5000 lb lots; cast, 41.00, 5000-10,000 quantities.

Nickel: Depolarized, less than 100 lb, 101.50; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 113.50; 200-499 lb, 112.00; 500-999 lb, 11.50; 1000 lb or more, 111.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30, f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 74.80; 300-900 lb, 72.80.

Copper Sulphate: 100-1900 lb, 15.20; 2000-5900 lb, 13.20; 6000-11,900 lb, 12.95; 12,000-22,900 lb, 12.70; 23,000 lb or more, 12.20.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400 lb, 43.50; 5000 lb, 41.50; 10,000 lb, 40.50.

Nickel Sulphate: 100 lb, 40.50; 200 lb, 38.50; 300 lb, 37.50; 400-4900 lb, 35.50; 5000-29,900 lb, 33.50; 30,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.50; 200 lb, 25.80; 400 lb, 22.80; 1000 lb, 21.80; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 75.80; 100-600 lb, 66.80; 700-1900 lb, 64.00; 2000-9900 lb, 62.20; 10,000 lb or more, 60.80.

Stannous Chloride (anhydrous): Less than 25 lb, 165.30; 25 lb, 130.30; 100 lb, 115.30; 400 lb, 112.90; 5200-19,600 lb, 100.70; 20,000 lb or more, 88.50.

Stannous Sulphate: Less than 50 lb, 128.10; 50 lb, 98.10; 100-1900 lb, 96.10; 2000 lb or more, 94.10.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(Concluded from page 191)

Prices on railroad, and melting steel grades and cast iron are up $2 to $3.50 the last couple weeks.

Seattle—Scrap prices have been revised downward in line with changes in other areas over the country. No. 1 heavy melting is quoted at $46, and No. 2 heavy melting at $44. Sales volume is smaller and there is little activity in the export market. Large domestic buyers have above-normal inventories.

San Francisco — No. 2 heavy melting steel was marked down $1 a ton to $45 last week. There is some confusion in the market as to the level of prices on other grades. Some dealers reported prices off $1, but others maintained that prices are nominally unchanged in the absence of a buying test.

Los Angeles—Mill purchases of scrap have dropped to a new low point for the year to date in this area. Prices are uncertain and nominal, lacking a buying test.

Galvanizing Worries?
End Them by Contacting—
NATIONAL GALVANIZING COMPANY

Who will:

1. Do your galvanizing for you in the world's most modern and efficient galvanizing plant (which we would like you to consider your own private galvanizing department).

OR

2. Build and operate complete job galvanizing facilities in your city.

OR

3. Engineer and install modern, low-cost facilities to replace outmoded galvanizing operations.

NATIONAL GALVANIZING COMPANY
4000 Grand Avenue
Pittsburgh 25, Pa.
Galvanizing facilities to process 200 tons of job work per day

CLASSIFIED

DISTRIBUTORSHIPS WANTED

Connecticut concern established 53 years seeking new lines for direct selling to all industrial plants, heating and electrical contractors. Engineering department available if necessary for the sale of product. State if item ever sold in Connecticut and send catalogs, prices, discounts and any other pertinent information to BOX 571, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

FABRICATOR STRUCTURAL STEEL, BRIDGES, plate work heavy construction equipment, and miscellaneous steel work, in all phases of steel fabrication, welded or riveted construction. Married, best reference. Available at once. Write Box 578, STEEL, Penton Bldg., Cleveland 13, Ohio.

FOR SALE

1. Gleason 15″ bevel gear quenching press, serial #8080, made by Gleason Works, Rochester, N. Y.
2. Gogan Tester, Brinell, model 1618-2, serial #5250-5 10″ throat.
3. Barkling Hi-speed furnace gas fired, serial #3117, opening 6″ by 8½″, no instruments; good condition.
4. Pittsburgh Instrument and Machine, Brinell test machine, serial #1118.
5. Cyanide furnace with salt pot; Standard American make — 1948. Pot size 24″ x 20″, equipped with blower, valves, ventilating hood with stack 18″ dia. 18 ft. high with Brown indicating control instrument.
6. Flexible mechanical power press, 8 ton; make—General. Type #83, Serial #2090, 9″ stroke, good condition.
7. Wheelabrator Tumblast; size 36″ x 42″, serial #A48990; make—American Wheelabrator, complete, with or without dust collector.
8. Hydroscale for crane or hoist; Model #CH705-30; capacity 15,000 lbs., dial diameter 30″, excellent condition, used only 1 month.
9. 10″ bench lathe mounted on steel table; ¾ HP, single phase 110-220 volts, 3 jaw chuck, 4 jaw chuck; face plate; tool holders; set of threading gears.
10. Two (2) Lindberg hydrvzing furnaces, tvne T-243618-HYT, Serial No. 3569 and 3570 with Leeds and Northrup instruments.

For prices and additional details
Write
Mr. L. P. Josephs
PEARSON EQUIPMENT CORP.
5757 West Ogden Avenue
Chicago 50, Ill., Tel. BIshop 2-1757

Wanted To Purchase

ROLLING

MILL

5½ x 18 x 18, 2 high/4 high mill. Both work rolls and back-up rolls should be driven. Work rolls can be 5½″ to 6″ dia., work rolls and back-up rolls can be 16″ to 20″ wide. Motor-Driven screwdowns desirable. Drive should be 100 hp. minimum, 440 volts. State make, age, location, price.

FANSTEEL
METALLURGICAL
CORPORATION
Geo. C. Conner, Purch. Dept.
North Chicago, Illinois

FOR CLASSIFIED RATES
And Further information write
STEEL., Penton Bldg., Cleveland 13, O.

825-pound Pintle Bushing, for a hydroelectric power project

NBD ...TOPS FOR BIG BRONZE BUSHINGS...

NBD is geared for big stuff like this, or smaller parts, long-run . . . bushings, bearings, gear blanks, pump parts. We cast them in weights up to 20,000 lbs. Machined to any degree of finish, in diameters up to 72 inches. Precise tolerances held to your specifications.

NBD specializes in bronze metallurgy and casting techniques; has developed more than 40 special alloys. Completely equipped for shell mold, cast-to-size and centrifugal casting.

For top quality and know-how in bronze castings, call or write us for quotes or information.

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

4930 Manchester Avenue • St. Louis 10, Missouri

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Coming Aug. 19 IN STEEL

New Markets for Aluminum

Capacity has at last caught up with demand for the light metal. But expansion plans continue.

Next week STEEL will show how new markets are being nurtured, especially in the automotive field. To learn about one of metalworking's most spectacular development programs, read the Aug. 19 issue.

ROBERT S. STEVENSON

Portrait by Fabian Bachrach

"At Allis-Chalmers we believe that we can do our fellow-employees no greater favor than to recommend that they invest in a 'nest-egg' fund of U.S. Savings Bonds.

"While this program has been going on for many years—made easy through the Payroll Savings Plan—we recently offered all Allis-Chalmers people a chance to review their individual bond purchasing schedules and to bring them up to date.

"As a result, more than 52% of the total Allis-Chalmers organization of about 40,000 people are buying U.S. Savings Bonds at a rate of approximately $6,000,000 a year."

ROBERT S. STEVENSON, *President*
Allis-Chalmers Manufacturing Company

Start your employees on the path of future financial security through automatic savings in the new and improved Series E Savings Bonds. It's simplicity itself. Just contact your State Director, U.S. Savings Bonds Division. He'll provide all the material and assistance you need to install a Payroll Savings Plan or build enrollment in one already existing. Look him up in the phone book or write for full information to the U.S. Savings Bonds Division, Treasury Department, Washington, D.C.

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The Metalworking Weekly

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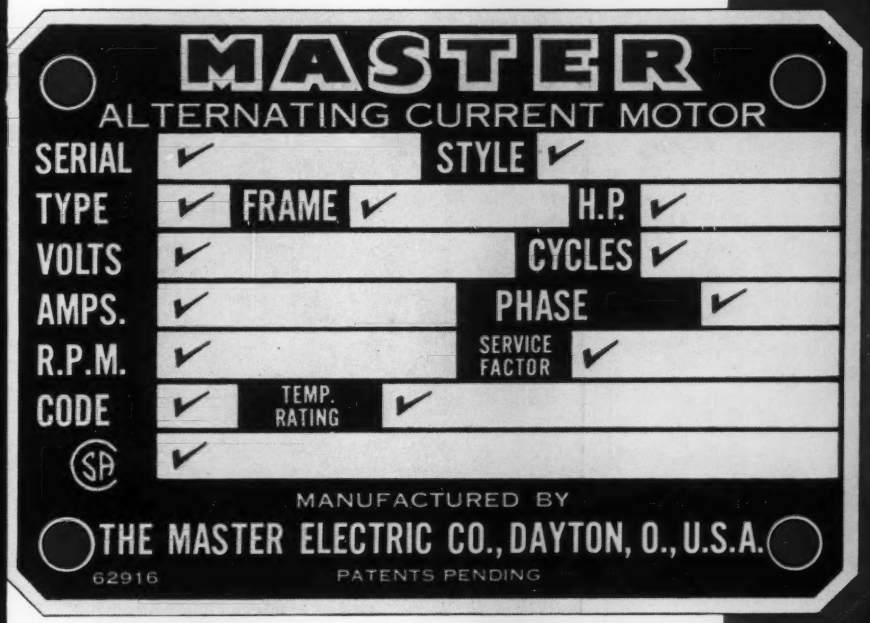
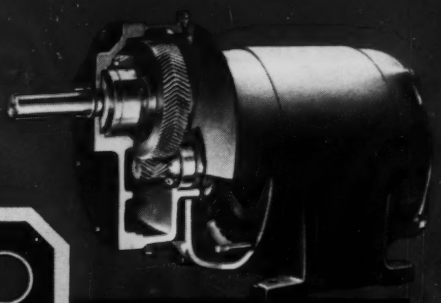
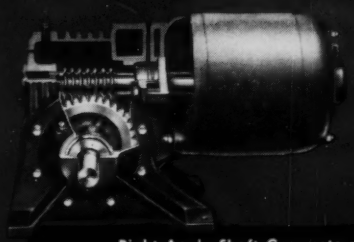
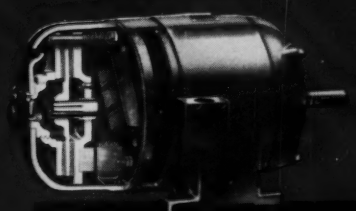




Parallel Shaft Gearmotors

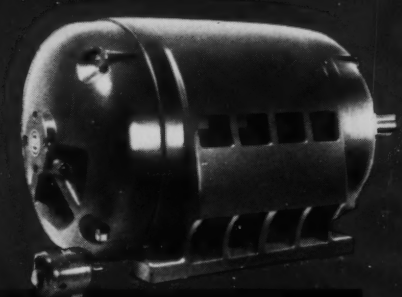


Right-Angle Shaft Gearmotors



Unibrake Motors

Speedrangers



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Construction ....Open, enclosed, splash-proof, fan-cooled, explosion-proof, special purpose.

Speeds .....Single speed, multi-speed, and variable speed.

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